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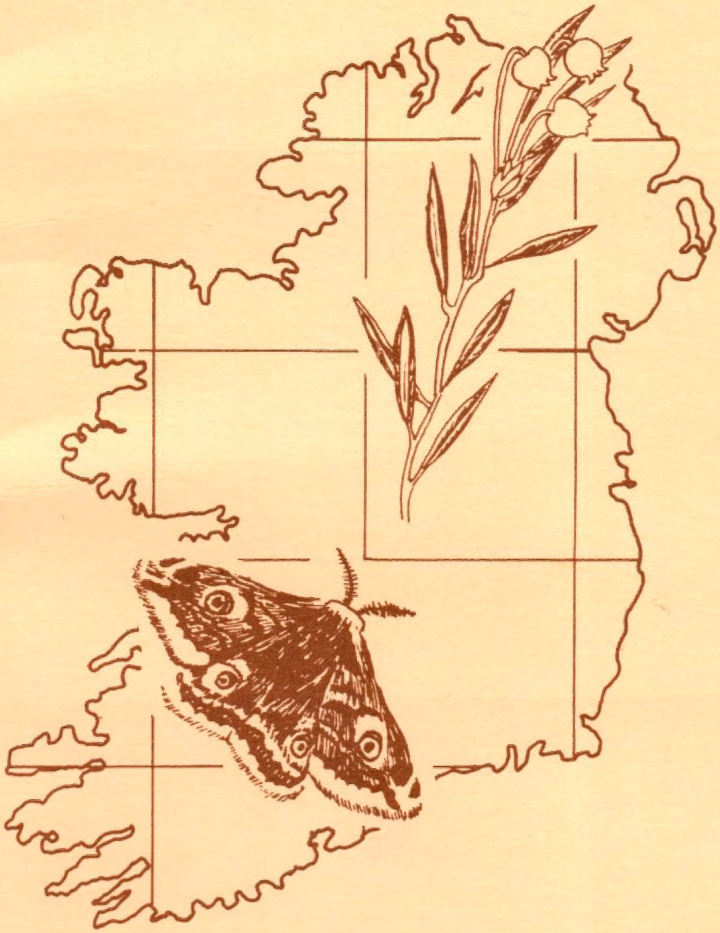

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EDITORIAL

This year's Bulletin is both a varied and an interesting one. It includes many species new to Ireland including eleven copepods. On behalf of the Society, I wish to thank our sponsors, the authors of the articles, the referees and all those who helped with its production. A special word of thanks is due to Mr J. M. C. Holmes for his invaluable assistance. Several manuscripts have already been received for Bulletin No. 16 and authors interested in submitting articles to this issue are recommended therefore to send them to the Editor as soon as possible. Bulletin No. 16 will contain the names of the members of the 1992 and 1993 committees of the Society.

J. P. O'Connor
Editor
3 November 1992

Bull. Ir. biogeog. Soc. No. 15 (1992)

A LIST OF THE POECILOSTOMATOIDA (CRUSTACEA: COPEPODA) OF IRELAND

J. M. C. Holmes and R. V. Gotto

The Poecilostomatoida constitutes an Order of the Subclass Copepoda. The animals occur in marine, brackish, and freshwater habitats, and are usually found in some sort of association with other animals.

They are perhaps the most diverse order of copepods in terms of gross body morphology (Huys and Boxshall, 1991), containing virtually free-living cyclopiform species and bizarre parasitic forms. They are, however, united in having similar mouthparts. These structures are modified for gathering particulate food matter from the mucous produced by other animals.

Ecologically, they can be divided conveniently into three groups:- the invertebrate associates, the planktonic species, and the fish parasites.

The invertebrate associates come in a great variety of shapes and sizes. Many marine invertebrates, particularly those which produce a lot of mucous, harbour one or more species of these copepods. The invertebrate groups include coelenterates, worms of various sorts, molluscs, echinoderms, and ascidians, amongst others.

A number of forms (Coycaeidae, Sapphirinidae, and Oncaeidae), belonging to this order, lead a wholly pelagic life (Sars, 1917). However they are possibly not truly planktonic, but may be associated, at least at times, with larger planktonic organisms (Heron and Damkaer, 1978). For most of the species, the precise nature of any association and the appropriate host is unknown.

The fish parasites can be grouped into three categories: the Taeniacanthidae and Bomolochidae, moderately modified and associated with various marine fish; the Ergasilidae, parasitic on freshwater or brackish water fish; and the Chondracanthidae and Philichthyidae, extremely degenerate parasites on marine fish.

This paper is an attempt to gather together a comprehensive annotated check-list of the poecilostome copepods of Ireland. It is based primarily on a re-assessment of the published records in the scientific literature, augmented by some new data.

The last complete check-list was by Pearson (1905, 1906), who listed 15 species which would belong to the present order, and a new list is now appropriate. There have been many studies done since Pearson, and a significant number of species added to the Irish fauna (e.g., Gotto, 1966; O'Riordan, 1966).

The species list is laid out in much the same format as in a similar list of the harpacticoid copepods of Ireland (Holmes and O'Connor, 1990). The genera and species are listed in alphabetical order within families. Synonyms which appear in the Irish literature are given under the relevant modern names. Where a species has been recorded in the literature under a name which is not a synonym, i.e., misidentified, the original name is included for reference purposes. Material lodged in the National Museum of Ireland is indicated NMI. For each species, the records are listed county by county in alphabetical order. For each county, the records are listed in order of date with the published records first and then the new unpublished data. For the published material, only the original record is cited, as some papers repeat previous data. Grid references are given for the unpublished but not for the published records.

Most of the material has come from one of two places; Strangford Lough, Co.Down, and Lough Hyne, Co.Cork. The name of this latter lough has been a source of much discussion. At times it has been called "L. Ine", "Loughine","L. Hyne (Ine)", or "L. Hyne". The last version is used here.

List of collectors and abbreviations used for collectors' names:- D. Minchin = D.M.; J. M. C. Holmes = J.M.C.H.

Ecological information is kept to a minimum. For each species, data are given, inter alia, on whether it is
(a) marine, brackish or freshwater,
(b) attracted to a light-trap (Holmes and O'Connor, 1988),
(c) associated with a particular habitat or animal group.
Where relevant a brief discussion on taxonomic problems or other matters follows.

The present check-list contains 74 species in 19 families. All previous records of Irish poecilostome species, both marine and freshwater, are cited. In addition, there are 74 new records. 11 species are new to Ireland. These are indicated by *.

Studies on the Irish fauna are far from complete. Of the 86 poecilostome marine invertebrate associates listed by Gotto (in press) from the European Atlantic seaboard, only 41 appear in the present check-list. Similarly, Of the 24 poecilostome fish parasites covered by Kabata (1979), only 9 appear here. It is hoped therefore that this provisional list will provide a basis for future research.

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List of Irish Poecilostomatoida

Family ERGASILIDAE

Ergasilus gibbus von Nordmann, 1832
Ireland (Fryer, 1978, 1982); GALWAY: Corrib catchment area (Conneely and McCarthy, 1984) (NMI).
Brackish. On gills of eel Anguilla anguilla (L.) (Kabata, 1979).

Thersitina gasterostei (Pagenstecher, 1861)
MAYO: several ♂♂, L. Furnace, L99, x.1970, J.M.C.H.; WEXFORD: Lady's Island L. (Healy et al., 1982); several ♀♀, Ballyteige, S935065, on Gasterosteus aculeatus L., 5.vi.1988, J.M.C.H. (NMI); several ♂♂, Ballyteige, S935065, light-trap, 1m, 6.vi.1988, J.M.C.H. (NMI).
Brackish. Males in light-trap. Inside the gill covers of sticklebacks, Gasterosteus aculeatus L. and Pungitius pungitius (L.) (Gurney, 1933).

Family SABELLIPHILIDAE

Herrmannella duggani Holmes and Minchin, 1991
GALWAY: Ballynakill Bay (Holmes and Minchin, 1991) (NMI); MAYO: Clew Bay (Holmes and Minchin, 1991) (NMI).
Marine. With the oyster Ostrea edulis L. (Holmes and Minchin, 1991).

Herrmannella parva Norman and T.Scott, 1905
CORK: L. Hyne (Holmes, 1985b) (NMI); GALWAY: Salt L., Clifden (Holmes and Minchin, 1991) (NMI).
Marine. Light-trap. Associate unknown.

Herrmannella pecteni (Sowinski, 1884)
(= Paranthessius pectinis (Pesta))
CORK: L. Hyne (Holmes, 1985b; Holmes and O'Connor, 1991) (NMI); KERRY: Kilmakilloge Harbour (Holmes and Minchin, 1991) (NMI). Marine. Light-trap. In pectinid bivalves such as Chlamys opercularis (L.), C. tigerina (Müller) and C. varia (L.) (Humes and Stock, 1973). Also in Pecten maximus (L.) (Holmes and Minchin, 1991).

Herrmannella rostrata Canu, 1891
(= Paranthessius rostratus (Canu))
CORK: Castlehaven Bay (Holmes and Minchin, 1991) (NMI); DUBLIN: Dublin Bay (Holmes and Minchin, 1991) (NMI). Marine. Light-trap. In the pallial cavity, notably of cockle Cerastoderma edule (L.) (Scott, 1905), and also several other bivalves, including Solen marginatus Pulteney, Ensis siliqua (L.), Macoma baltica (L.), Spisula solida (L.), S. subtruncata (da Costa), Mactra corallina (L.), Lutraria lutraria (L.), Venerupis pullastra (Montagu), and V. decussata (L.) (Bocquet and Stock, 1959).

Modiolicola maximus (I.C.Thompson, 1893)
(= Hermanella maxima (Thompson))
CORK: L. Hyne (Holmes, 1980) (NMI); DOWN: off Strangford Bar (Williams, 1954); GALWAY: Ballynakill Harbour (Farran, 1913); KERRY: Kilmakilloge Harbour (Holmes and Minchin, 1991) (NMI); several specimens, Valentia Harbour, V47, 25.v.1979, D.M. Marine. In great scallop Pecten maximus L. (Farran, 1913; Humes and Stock, 1973).

*Myxomolgus myxicolae (Bocquet and Stock, 1958)
CORK: 1♂3♀♀, The Goleen, W095278, L. Hyne, from mucous tube of Myxicola infundibulum (Rénier), 18.vii.1991, J.M.C.H. (NMI); 1♀, North Basin, W098285, L. Hyne, from mucous tube of M.

infundibulum, 8.viii.1992, J.M.C.H. (NMI).
Marine. In tube of polychaete Myxicola infundibulum (Rénier) (Bocquet and Stock, 1958b).

Paranthessius anemoniae Claus, 1889
CORK: L. Hyne (Holmes, 1983) (NMI); 5♂♂1♀, Castlehaven Bay, W175293, light-trap, 5m, 17.viii.1985, J.M.C.H. (NMI); DOWN: Ardkeen, Strangford L. (Gotto and Briggs, 1972; Briggs, 1973).
Marine. Light-trap. With anemone Anemonia viridis (Forskål) (Humes and Stock, 1973). Gotto and Briggs (1972) discussed the possibility that Brady (1880) may well have used Irish material of P. anemoniae for his figure of Lichomolgus furcillatus Thorell.

Sabelliphilus elongatus M.Sars, 1862
DOWN: Ringhaddy Sound, Strangford L. (Gotto, 1954a); several areas of Strangford L. (Gotto, 1960a); DUBLIN: 2♂♂1♀, Station S.501, 15km east of Rockabill, 66m, on Sabella sarsii (Krøyer), 25.ii.1907, Fisheries (NMI).
Marine. On the branchial crown of the peacock worm Sabella sarsii (Krøyer) (Gotto, 1954a; Humes and Stock, 1973).

Scambicornus finmarchicus (T.Scott, 1903)
(= Scambicornus armoricanus (Bocquet, Stock and Kleeton, 1963) syn. nov.)
CORK: L. Hyne (Holmes, 1985b, 1987; Holmes and O'Connor, 1991) (NMI); 1♀, North Quay, W094288, L. Hyne, light-trap, 2m, 31.vii.1985, J.M.C.H. (NMI); 1♂, Castlehaven Bay, W175293, light-trap, 5m, 17.viii.1985, J.M.C.H. (NMI); 1♂, north shore, L. Hyne, W093288, on bootlace worm Lineus longissimus (Gunnerus), 2m, 17.vii.1991, J.M.C.H. (NMI); 1♀, south shore, L. Hyne, W097280, light-trap, 2m, 25.vii.1991, J.M.C.H. (NMI); 1♂, Rapids area, W100282, L. Hyne, washings from rock, 5.viii.1992, J.M.C.H. (NMI). GALWAY: 1♂, Salt Lake, L6649, Clifden, Serpula reef, vii.1980, B. O'Connor (NMI).

Marine. Light-trap. This species was originally described (as ? Herrmanella finmarchica), from the female only, from Norway (Scott, 1903). It was further described and figured by Sars (1918), again from the female only and again from Norway. The caudal ramus of these females was about four times as long as wide. The host was unknown. Scambicornus armoricanus (Bocquet, Stock and Kleeton, 1963) was described (as Preherrmannella armoricana), from the male only, from Brittany, on the polychaete Polymnia nebulosa (Montagu). The caudal ramus was about twice as long as broad. Both sexes occur in L. Hyne, Co.Cork. Excluding the usual sexual differences such as the shape of the genital segment and the fifth legs and the structure of the maxillipeds, and apart from the caudal rami, all other features in both sexes are the same, and the synonymy of the two species is now confirmed.

Family LICHOMOLGIDAE

Acaenomolgus protulae (Stock, 1959)
(= Lichomolgus protulae Stock)
DOWN: Strangford L. (Gotto, 1961a).
Marine. On branchial filaments of polychaete Protula tubularia (Montagu) (Humes and Stock, 1973).

*Astericola clausi Rosoll, 1889
CORK: 1♂1♀, North Basin, W096288, L. Hyne, from Marthasterias glacialis (L.), 17.vii.1991, J.M.C.H. (NMI); 3♂1♀, South Basin, W099284, washings from rock with Asterias rubens L. and Asterina sp., 15.vii.1992, J.M.C.H. (NMI); 1♂2♀, Rapids area, W100282, L. Hyne, washings from rock with A. rubens, 5.viii.1992, J.M.C.H. (NMI).
Marine. On several species of starfish (Humes and Stock, 1973).

Critomolgus actiniae (Della Valle, 1880)
(= Lichomolgus actiniae Della Valle)
(= Doridicola actiniae (Della Valle)
DOWN: Ardkeen, Strangford L. (Briggs, 1973).
Marine. With anemone Anemonia viridis (Forskål) (Briggs, 1973).

*Critomolgus bulbipes (Stock and Kleeton, 1963)
(= Lichomolgus bulbipes Stock and Kleeton)
CORK: several specimens, Barloge, W103271, near L. Hyne, from Alcyonium digitatum (L.) collected by T. Flint and C. Frid, 15.vii.1992, J.M.C.H. (NMI); DOWN: several specimens, Ringhaddy Sound, J5359, Strangford L., from A. digitatum collected by I. Lawlor, 20m on sunken wreck, 27.ix.1991, J.M.C.H. (NMI); DUBLIN: 3♂♂3♀♀, Tayleur Bay, O325510, Lambay I., from A. digitatum collected by M. Costello and I. Lawlor, 15m on sunken wreck, 19.vi.1991, J.M.C.H. (NMI).
Marine. On the alcyonaceans Alcyonium acaule Marion and Parerythropodium coralloides (Pallas) in the Mediterranean (Stock and Kleeton, 1963).

Doridicola agilis Leydig, 1853
(= Lichomolgus agilis (Leydig))
CLARE: Finavarra (Gotto, 1986); CORK: L. Hyne (Holmes, 1983) (NMI); 2♀♀, South Basin, W099284, L. Hyne, from Archidoris pseudoargus, 15.vii.1992, J.M.C.H.; DONEGAL: Murles Point (Boxshall and Platts, 1978); St.John's Point (Gotto, 1986); GALWAY: Ballynakill Harbour (Farran, 1913) (NMI); KERRY: Kilmakilloge Harbour (Minchin, 1987) (NMI).
Marine. On numerous nudibranchs and other invertebrates (Bocquet, Stock and Kleeton, 1963; Humes and Stock, 1973; Gotto, 1979).

Lichomolgella pusilla G.O.Sars, 1918
CORK: 2♀, Rapids area, W100282, L. Hyne, washings from rock, 5m, 8.viii.1992, J.M.C.H. (NMI).

WATERFORD: Dunmore East (Holmes and Jeal, 1987) (NMI).
Marine. Light-trap. Associate unknown (Humes and Stock, 1973).

Lichomolgides cuanensis Gotto, 1954
DOWN: Strangford L. (Gotto, 1954b); MAYO: several ♀♀, Carramore Strand, L795817, Louisburgh, from Tridemnum tenerum (Verrill) attached to cast-up weed, 27.viii.1987, J.M.C.H. (NMI).
Marine. In the cloacal cavities of ascidian Tridemnum tenerum (Verrill) (Gotto, 1960b).

Lichomolgus albens Thorell, 1859
CORK: 2♀, Mulroe Cove, V9240, near Durrus, Dunmanus Bay, from Corella parallelogramma (Müller), 13.viii.1979, J.M.C.H. (NMI); DONEGAL: L. Swilly (Brady, 1880, as L. furcillatus, possibly this species); 1♀, Mulroy Bay, from Molgula occulta Kupfer, 1985, D.M. (NMI); GALWAY: Roundstone Bay (Brady and Robertson, 1873, as L. furcillatus, possibly this species); MAYO: Westport Bay (Brady, 1880, as L. furcillatus, possibly this species.
Marine. In a number of ascidians, notably Corella parallelogramma (Müller) (Sars, 1917; Humes and Stock, 1973).

Lichomolgus canui G.O.Sars, 1917
CORK: North Channel, Cork Harbour (Minchin and Duggan, 1988) (NMI); DOWN: Ardkeen, Strangford L. (Gotto, 1961b); GALWAY: Ballynakill (Farran, 1913, as L. albens) (NMI).
Marine. In several ascidians, notably Clavelina lepadiformis (Müller) (Gotto, 1961b; Humes and Stock, 1973), and Styela clava Herdman (Minchin and Duggan, 1988).

Lichomolgus forficula Thorell, 1859
ANTRIM: Ballygally Bay and Larne L. (Pearson, 1905); CORK: 1♀, Rapids area, W100282, L. Hyne, washings from rock, 5.viii.1992, J.M.C.H. (NMI); DONEGAL: Mulroy L. (Brady, 1880); GALWAY: 1♂3♀♀, Roskeeda Bay, L9134, from Ascidia mentula Müller, vii.1972,

M. White (NMI); MAYO: Blacksod Bay (Farran, 1913).
Marine. In large simple ascidians such as Ascidia spp. and Phallusia mammillata (Cuvier) (Humes and Stock, 1973).

Lichomolgus furcillatus Thorell, 1859
There are unconfirmed and doubtful records from Roundstone and Westport Bays, and L. Swilly (Brady, 1880).
Marine. In branchial cavity of ascidians, notably Ciona intestinalis (L.) (Sars, 1917; Humes and Stock, 1973).

Lichomolgus marginatus Thorell, 1859
DOWN: outside entrance of Strangford L. (Gotto, 1957).
Marine. In branchial cavity of ascidians Ascidia virginea Müller and Ciona intestinalis (L.) (Gotto, 1957, 1960b).

Macrochiron fucicolum Brady, 1872
(= Lichomolgus fucicolus (Brady))
CORK: L. Hyne (Holmes, 1985b) (NMI); 1♀, Whirlpool Cliff, W100283, L. Hyne, light-trap, 15m, 12.vii.1990, J.M.C.H.; 1♂, Barloge, W100280, light-trap, 1m, 15.vii.1990, J.M.C.H. (NMI); 1♂, south shore, L. Hyne, W097280, light-trap, 21.vii.1990, J.M.C.H. (NMI); DONEGAL: L. Swilly (Brady, 1880); DOWN: off Newcastle (Brady, 1902); DUBLIN: numerous specimens, Tayleur Bay, O325510, Lambay I., light-trap, 15m, 20.vi.1991, J.M.C.H.; GALWAY: Clifden Bay (Brady and Robertson, 1873); Roundstone (Brady, 1880, 1902); Ballynakill (Farran, 1913) (NMI); 1♀, Finavarra, M241114, 13.v.1990, J.M.C.H. (NMI); MAYO: Westport Bay (Brady and Robertson, 1873).
Marine. Light-trap. Amongst shallow-water algae, otherwise associate unknown.

Zygomolgus didemni (Gotto, 1956)
(= Lichomolgus didemni Gotto)
DOWN: Strangford L. (Gotto, 1956).

Marine. In ascidian Didemnum maculosum (Milne Edwards), probably in the cloacal cavities (Gotto, 1960b).

*Zygomolgus poucheti (Canu, 1891)
MAYO: 1♀, Carramore Strand, L795817, Louisburgh, from Botryllus schlosseri (Pallas) on cast-up seaweed, 27.viii.1987, J.M.C.H. (NMI).
Marine. In ascidians (Sars, 1917). On surface of colonies of Morchellium argus (Milne Edwards) and Sidnyum elegans Giard (Gotto, 1960b).

Zygomolgus tenuifurcatus (G.O.Sars, 1917)
(= Lichomolgus tenuifurcatus G.O.Sars)
CORK: L. Hyne (Holmes, 1983); several specimens, L. Hyne, on colonies of Diplosoma listerianum (Milne Edwards), 3.viii.1987, 18.vii.1991, 20.vii.1991, 15.vii.1992, 5.viii.1992, J.M.C.H. (NMI); DONEGAL: Mulroy Bay (Fahy, 1986); DOWN: Strangford L. (Gotto, 1954a); GALWAY: several specimens, Salt Lake, L6649, Clifden, from Serpula reef, vii.1980, B. O'Connor (NMI); 1♂, Salt Lake, L6649, Clifden, from Serpula reef, 6m, vii.1982, D.M.
Marine. Light-trap. On holothurian Labidoplax digitata (Montagu) (Gotto, 1954a), and in colonies of ascidian Diplosoma listerianum (Milne Edwards) (Gotto, 1960b).

Family PSEUDANTHESSIIDAE

*Heteranthessius sp.
KERRY: 2♂♂ (bright red when alive), Knightstown, V428771, Valentia I., light-trap, 3m, 21.vii.1986, J.M.C.H. (NMI).
Marine. Light-trap. Humes and Stock (1973) were unable to prepare a satisfactory key to this genus, as, of the three described species, one is known only from the male and two only from the female.

*Nemerthessius nemertophilus (Gallien, 1936)
CORK: 8♂♂4♀♀, north shore, L. Hyne, W093288, from bootlace worm Lineus longissimus (Gunnerus), 2m, 17.vii.1991, J.M.C.H. (NMI).
Marine. On nemertean Lineus longissimus (Gunnerus) (Stock, 1985). The specimens from L. Hyne were obtained in the following way: the bootlace worm was placed in sea water in a petri dish and 70% alcohol was added, a few drops at a time. This irritant induced the worm to exude copious amounts of mucous which formed a halo around it. The mucous was then combed off with a forceps and put into a separate dish. After about an hour of this treatment, the production of mucous ceased. The copepods were found embedded in the mucous and were retrieved in perfect condition. None were to be found attached to the worm itself. Further, as all the mucous was removed, it was possible to preserve the worm without it breaking up.

*Pseudanthessius dubius G.O.Sars, 1918
CORK: 1♂2♀, Rapids area, W100282, L. Hyne, washings from rock with Asterias rubens, 5.viii.1992, J.M.C.H. (NMI).
Marine. With starfish Asterias rubens L. (Bresciani and Lützen, 1962).

Pseudanthessius gracilis Claus, 1889
CLARE: 1♂, Finavarra, M241114, littoral sand, 13.v.1990, J.M.C.H. (NMI); CORK: L. Hyne (Holmes, 1983; Holmes and O'Connor, 1991); 2♂♂, L. Hyne, W095289, light-trap, 2m, 26.vii.1985, J.M.C.H. (NMI); 1♀, Barloge, W100280, light-trap, 2m, 28.vii.1985, J.M.C.H.; 1♂, North Quay, W095288, L. Hyne, light-trap, 5m, 23.ix.1987, J.M.C.H. (NMI); 1♂2♀, Rapids area, W100282, L. Hyne, washings from rock, 5.viii.1992, J.M.C.H. (NMI); GALWAY: 5♂♂3♀♀, Salt Lake, L6649, Clifden, from Serpula reef, vii.1980, B.O'Connor (NMI); 1♀, south shore near ferry pier, L8462, Killary Harbour, 4m, Serpula reef, v.1984, D.M.
Marine. Light-trap. With polychaete Pomatoceros triqueter (L.) and

bivalve Spisula subtruncata (da Costa) (Bocquet, Stock and Kleeton, 1963).

Pseudanthessius liber (Brady, 1880)
(= Lichomolgus liber Brady)
CORK: L. Hyne (Holmes, 1983); 1♀, off Galley Cove, V7924, near Crookhaven, from Echinus esculentus L., 9.vii.1982, Naas Diving Club (NMI); 3♂♂1♀, L. Hyne, W094280, from E. esculentus, 16.vii.1990, J.M.C.H. (NMI); DONEGAL: L. Swilly (Brady, 1880) (NMI); KERRY: off south west coast of Ireland (Thompson, 1903).
Marine. On several regular echinoids; Echinus esculentus L., Psammechinus miliaris (Gmelin), Paracentrotus lividus (Lamarck) (Bocquet, Stock and Louise, 1963).

Pseudanthessius thorelli (Brady, 1880)
KERRY: north of entrance to Kilmakilloge Harbour (Minchin, 1987) (NMI).
Marine. With bivalve Chlamys opercularis (L.) (Humes and Stock, 1973), with coral Cladocora caespitosa (L.) (Stock and Weinberg, 1985), and with gorgonian Swiftia pallida Madsen (Minchin, 1987).

Family ONCAEIDAE

Epicalymma exigua (Farran, 1908)
(= Oncaea exigua Farran)
MAYO: off west coast of Ireland (Farran, 1908).
Marine, planktonic. Associate unknown.

Lubbockia brevis Farran, 1908
MAYO: 40 miles north by west of Eagle I. (Farran, 1908).
Marine, planktonic. Associate unknown.

Lubbockia minuta Wolfenden, 1905
Off west coast of Ireland (Wolfenden, 1905; Heron and Damkaer,

1978).
Marine, planktonic. Associate unknown.

Oncaea conifera Giesbrecht, 1891
GALWAY: off Cleggan (Farran, 1903); off west coast of Ireland (Farran, 1905); MAYO: off west coast of Ireland (Farran, 1908); off Clare I. (Farran, 1913); 3♀♀, off coast of Co.Mayo, 53°53'N. 10°51'W., 155m, 8.xi.1988, D.M. (NMI).
Marine, planktonic. Associate unknown.

Oncaea gracilis (Dana, 1849)
(= Conaea gracilis (Dana))
(= Conaea rapax Giesbrecht)
GALWAY: off west coast of Ireland (Farran, 1905); KERRY: off south west coast of Ireland (Thompson, 1903); MAYO: off west coast of Ireland (Farran, 1908).
Marine, planktonic. Associate unknown.

Oncaea media Giesbrecht, 1891
CORK: 1♀, Castlehaven Bay, W175293, light-trap, 5m, 17.viii.1985, J.M.C.H. (NMI); GALWAY: off Cleggan (Farran, 1903).
Marine, surface plankton. Light-trap. Associate unknown.

Oncaea mediterranea (Claus, 1863)
KERRY: Valentia Harbour (Thompson, 1896, 1900); off south west coast of Ireland (Thompson, 1903); MAYO: off west coast of Ireland (Farran, 1908); 3♂♂3♀♀, off coast of Co.Mayo, 53°53'N. 10°51'W., 155m, 8.xi.1988, D.M. (NMI).
Marine, planktonic. Associate unknown.

Oncaea minuta Giesbrecht, 1892
KERRY: off south west coast of Ireland (Thompson, 1903); MAYO: off west coast of Ireland (Farran, 1908).
Marine, planktonic. Associate unknown.

Oncaea notopus Giesbrecht, 1891
MAYO: off west coast of Ireland (Farran, 1908).
Marine, planktonic. Associate unknown.

Oncaea obscura Farran, 1908
MAYO: off west coast of Ireland (Farran, 1908).
Marine, planktonic. Associate unknown.

Oncaea ornata Giesbrecht, 1891
MAYO: off west coast of Ireland (Farran, 1908).
Marine, planktonic. Associate unknown.

Oncaea subtilis Giesbrecht, 1892
CORK: L. Hyne (Thain et al., 1981; Holmes, 1985b; Holmes and O'Connor, 1991); several specimens, L. Hyne, W095283, light-trap, 20m, 14.vii.1990, J.M.C.H. (NMI); MAYO: off west coast of Ireland (Farran, 1908).
Marine, planktonic. Light-trap. Associate unknown.

Oncaea venusta Philippi, 1843
Off south west coast of Ireland (Bourne, 1890a, as O. obtusa Dana, possibly this species).
Marine, planktonic. Associate unknown.

*Pseudolubbockia dilatata G.O.Sars, 1909
KERRY: 1♂, off coast of Co.Kerry, 52°00'N. 12°00'W., 700m, 22.iv.1990, D.M. (NMI).
Marine, planktonic. Associate unknown. Its known world distribution was discussed by Heron and Damkaer (1969):- some ♀♀ specimens collected off the Azores in the first decade of the century, and several specimens (76♀♀ 2♂♂) from the Gulf of Alaska. The species is of interest in that it exhibits what is regarded as the ancestral state of the male poecilostomatoid maxilliped (Huys and Boxshall, 1991). The present specimen was examined by Dr

Boxshall and the structure of its maxilliped confirmed.

Family SAPPHIRINIDAE

Corina granulosa Giesbrecht, 1891
KERRY: off south west coast of Ireland (Thompson, 1903); 50 miles W.N.W. of Tearaght (Farran, 1908).
Marine, planktonic. Associate unknown.

Sapphirina iris Dana, 1849
KERRY: off south west coast of Ireland (Thompson, 1903, as S. salpae, possibly this species).
Marine, planktonic. With salps (Sars, 1921).

Family CLAUSIDIIDAE

Conchyliurus cardii Gooding, 1957
CORK: Barloge, near L. Hyne (Holmes, 1987); DUBLIN: Dublin Bay (Holmes, 1986).
Marine. Light-trap. With bivalves Acanthocardia echinata (L.) and Meretrix chione (L.) (Gooding, 1957; Bocquet and Stock, 1958c); with rough cockle, Acanthocardia tuberculata (L.) (Holmes, 1986).

Hemicyclops aberdonensis (T.Scott and A.Scott, 1892)
CORK: L. Hyne (Holmes, 1985b; Holmes and O'Connor, 1991);
DUBLIN: Dublin Bay (Holmes, 1986).
Marine. Light-trap. Associate unknown.

Hersiliodes latericia (Grube, 1869).
CORK: L. Hyne (Holmes, 1986; Holmes and O'Connor, 1991);
DUBLIN: Dublin Bay (Holmes, 1986).
Marine. Light-trap. With polychaetes Clymene oerstedi Claparède and Leiochone clypeata de St.Joseph (Bocquet, Stock and Kleeton, 1963).

Family CLAUSIIDAE

*Presynaptiphilus acrocnidae Bocquet and Stock, 1960
DUBLIN: 1♀, off Scotsman's Bay, (O265296), Dublin Bay, 14m, fine sand, RV 'Lough Beltra', 11.ix.1992, J.M.C.H. (NMI).
Marine. On the oral surface of brittle-star Acrocnida brachiata (Montagu) (Bocquet and Stock, 1960).

Rhodinicola sp.
GALWAY: inner Galway Bay (Gotto and O'Connor, 1980).
Marine. With maldanid polychaete (Gotto and O'Connor, 1980).

Family SYNAPTIPHILIDAE

Synaptiphilus tridens (T.Scott and A.Scott, 1893)
DOWN: eastern shore of Strangford L. (Gotto, 1959).
Marine. On the skin and tentacles of holothurians Leptosynapta inhaerens (Müller) and Labidoplax media Östergren (Gotto, 1959, 1979).

Family EUNICICOLIDAE

Eunicicola insolens (T.Scott and A.Scott, 1898)
DOWN: outside the entrance of Strangford L. (Gotto, 1963).
Marine. With polychaete Eunice harassii Audouin and Milne Edwards (Gotto, 1963).

Family MYTILICOLIDAE

Mytilicola intestinalis Steuer, 1902
CLARE: sites in Galway Bay (Murray, 1972); Ballyvaughan (Crowley, 1972); CORK: Crosshaven (Grainger, 1951); Fountainstown (Grainger, 1951; Crowley, 1972); Kinsale (Grainger, 1951; Gibson, 1961; Crowley, 1972); Oysterhaven (Gibson, 1961); Youghal (Crowley,

1972); 8♀, Ahanesk, W8570, West Channel, Cork Harbour, from Mytilus edulis, 10.vii.1983, M. Crowley (NMI); GALWAY: Kinvara (Grainger, 1951; Crowley, 1972); Rinvyle and Mweeloon Bays (Gibson, 1961); sites in Galway Bay (Murray, 1972); Clarinbridge, Oranmore and Rosshill (Crowley, 1972).
Marine, estuarine. Parasitic in the gut of bivalves, Mytilus spp. (Grainger, 1951), Dosinia exoleta (L.) and Modiolus barbatus (L.) (Bocquet and Stock, 1957).

Family ANTHESSIIDAE

Anthessius arenicolus (Brady, 1872)
(= Hermanella arenicola (Brady))
CORK: L. Hyne (Holmes, 1985b); 3♂♂2♀♀, Barloge, W101279, light-trap, 5m, 28.vii.1985, J.M.C.H. (NMI); several specimens, Castlehaven Bay, W175293, light-trap, 5m, 17.viii.1985, J.M.C.H. (NMI); 2♀♀, Sherkin I., W008259, light-trap, 10m, sand, 3.viii.1987, J.M.C.H; 3 specimens, Sherkin I., W014259, 4m, muddy sand, 3.viii.1987, J.M.C.H.; 1♂, north shore, L. Hyne, W095289, light-trap, 5m, 23.ix.1987, J.M.C.H.; 1♀, south shore, L. Hyne, W097280, light-trap, 5m, 11.vii.1990, J.M.C.H. (NMI); GALWAY: Ballynakill Harbour (Farran, 1913) (NMI).
Marine. Light-trap. In the pallial cavity of bivalve Dosinia exoleta (L.) (Bocquet and Stock, 1958a).

Family CORYCAEIDAE

Corycaeus anglicus Lubbock, 1855
CLARE: off the west Clare coast (Fives, 1969); stations in Galway Bay (Boyd, 1973); CORK: Kinsale Harbour (Brady and Robertson, 1873; Bourne, 1890b); Fastnet Rock (Gough, 1906); Cork Harbour (Boyd, 1972); Courtmacsherry Bay (Dorman, 1988) (NMI).
GALWAY: off Cleggan (Farran, 1903); Ballynakill Harbour (Farran, 1913); Mutton I. and Kilkieran Bay (Fives, 1969); stations in

Galway Bay (Boyd, 1973); GALWAY/MAYO: Killary Harbour (Ryan et al., 1986); KERRY: Dingle Bay, and near the Skelligs (Brady and Robertson, 1873); Valentia Harbour (Brady and Robertson, 1983; Thompson, 1897, 1900); near Valentia (Brady, 1880); off south west coast of Ireland (Bourne, 1890a; Thompson, 1903); MAYO: off Clare I. (Farran, 1914); several specimens, off coast of Co.Mayo, 53°53'N. 10°51'W., 155m, 8.xi.1988, D.M. (NMI); WEXFORD: South Arklow Lightship, and Coningbeg Lightship (Gough, 1906).
Marine, planktonic. Associate unknown.

Corycaeus speciosus Dana, 1849
KERRY: Valentia Harbour (Thompson, 1896, 1897, 1900).
Marine, planktonic. Associate unknown.

Corycaeus venustus Dana, 1849
KERRY: off south west coast of Ireland (Thompson, 1903, doubtful record).
Marine, planktonic. Associate unknown.

Family BOMOLOCHIDAE

*Holobomolochus confusus (Stock, 1953)
(= Bomolochus confusus Stock)
CORK: 2♀♀, Courtmacsherry Bay, from nasal cavity of ling Molva molva (L.), 12.viii.1987, J.M.C.H. (NMI); DUBLIN (?): several specimens (still alive when found), Dublin fish shop, from nasal cavity of cod Gadus morhua L., vi.1983, J.M.C.H. (NMI); KERRY: 1♀, W.N.W. of Skelligs, from nasal cavity of greater fork-beard Phycis blennoides (Brünnich), iv.1984, K.Flannery (NMI).
Marine. In nasal cavity of gadids, notably Gadus morhua L. (Kabata, 1979). Farran (1913) recorded Bomolochus soleae Claus from Ballynakill, Co.Galway. This species was not then distinguished from H. confusus (see Stock, 1953). However, an examination of the specimen, preserved on a slide in NMI, has

revealed it to be a male haplostomin, a member of a different group of copepods.

Family TAENIACANTHIDAE

Anchistrotos lucipetus Holmes, 1985
CORK: L. Hyne (Holmes, 1985a, 1987; Holmes and O'Connor, 1991). Marine. Light-trap. With several gobies; black goby Gobius niger L., red-mouthed goby G. cruentatus Gmelin, rock goby G. paganellus L., Couch's goby G. couchi Miller, and Fries' goby Lesueurigobius friesii (Collett) (Holmes, 1987).

Anchistrotos onosi (T.Scott, 1902)
CORK: L. Hyne (Holmes, 1985a); KERRY: several specimens, Porcupine Bank, from bigeye rockling Antonogadus macrophthalmus (Günther), 14.vi.1988, D. Quigley and K. Flannery (NMI).
Marine. Inside the gill covers of rocklings Ciliata mustela (L.) and Rhinonemus cimbrius (L.) (Kabata, 1979; Dojiri and Cressey, 1987); on shore rockling Gaidropsarus mediterraneus (L.) (Holmes, 1985a).

Family CHONDRACANTHIDAE

Acanthochondria cornuta (O.F.Müller, 1776)
(= Chondracanthus cornutus Edwards)
(= Acanthochondria flurae Krøyer)
CORK: Long Island Sound (O'Riordan, 1966) (NMI); L. Hyne (Holmes, 1983); 1♂1♀, Cork Harbour, from gills of plaice Pleuronectes platessa L., xi.1983, R. Fitzgerald (NMI); DUBLIN: Dublin market (Thompson, 1856).
Marine. On gills of several flatfishes (Kabata, 1979).

Chondracanthus lophii Johnston, 1836
(= Chondracanthus gibbosus Krøyer)
West of Ireland (O'Riordan, 1966); ANTRIM/DOWN: Belfast Bay (Thompson, 1856); CORK: Tragemona Bay, near L. Hyne (Renouf, 1931); DOWN: Strangford L. area (Williams, 1954); DUBLIN: Dublin (Thompson, 1856); ? Dublin Bay (O'Riordan, 1966).
Marine. In gill pouches of angler fish Lophius piscatorius L. (O'Riordan, 1966).

Chondracanthus merluccii (Holten, 1802)
CORK: Bantry Bay and Dunbeacon Harbour, Dunmanus Bay (O'Riordan, 1966) (NMI); DOWN: Dundrum Bay (Williams, 1954).
Marine. Mouth cavity of hake Merluccius merluccius (L.) (Williams, 1954).

Chondracanthus neali Leigh-Sharpe, 1930
Off south west Ireland (Leigh-Sharpe, 1930; Kabata, 1979).
Marine. On macrurid Malacocephalus laevis (Lowe) (Kabata, 1979).

Chondracanthus zei Delaroche, 1811
CORK: Long Island Sound (O'Riordan, 1966) (NMI);
DUBLIN (?): 1♂2♀♀, Dublin fish shop, from gills of john dory, Zeus faber L., 20.iv.1988, J.M.C.H. (NMI); GALWAY: Davalaun (O'Riordan, 1966) (NMI).
Marine. On gills of john dory, Zeus faber L. (O'Riordan, 1966).

Family SPLANCHNOTROPHIDAE

Lomanoticola insolens T.Scott and A.Scott, 1895
KERRY: Valentia Harbour (Scott and Scott, 1895).
Marine. In nudibranch Lomanotus marmoratus (Alder and Hancock) (Scott and Scott, 1895, as Lomanotus genei Vérany).

Splanchnotrophus gracilis Hancock and Norman, 1863
W. Ireland (Hancock and Norman, 1863).
Marine. In nudibranch Okenia aspersa (Alder and Hancock) (Hancock and Norman, 1863).

Family PHILICHTHYIDAE

Leposphilus labrei Hesse, 1866
CORK: L. Hyne (Holmes, 1987).
Marine. Embedded in the lateral line of corkwing wrasse Crenilabrus melops (L.) (Holmes, 1987).

Family LAMIPPIDAE

*Enalcyonium forbesi (T.Scott, 1901)
CORK: 1♀, Barloge, W103271, near L. Hyne, from Alcyonium digitatum (L.) collected by T. Flint and C. Frid, 15.vii.1992, J.M.C.H. (NMI).
Marine. In alcyonacean Alcyonium digitatum (L.) (Stock, 1988).

Enalcyonium rubicundum Olsson, 1869
(= Lamippe rubicunda (Olsson))
DOWN: Angus Rock, Strangford L. (Gotto, 1954a); DUBLIN: several specimens, Skerries, O2560, in Alcyonium digitatum (L.) cast up on beach, 29.xii.1987, J.M.C.H. (NMI); several specimens, Portmarnock, O248433, in A. digitatum cast up on beach, 27.xii.1990, J.M.C.H.; 4♀♀, Tayleur Bay, O325510, Lambay I., in A. digitatum on sunken wreck, 15m, 19.vi.1991, J.M.C.H. (NMI).
Marine. In alcyonacean Alcyonium digitatum (L.) (Stock, 1988).

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THE FLORA OF FOYNES ISLAND, CO. LIMERICK, IRELAND

Sylvia C. P. Reynolds and Julian D. Reynolds

Introduction

Foynes Island (national grid ref. R2452) lies in the Shannon Estuary less than 0.25km off the Co. Limerick shore, and 1.5km from Co. Clare at its nearest point (Figure 1). It is approximately circular, with an area of 120ha, and greatest diameter of 1.5km; the shoreline measures some 5.6km. The island slopes gently from western boulder beaches to an altitude of 60m, with low shale cliffs on most other shores and fringing saltmarsh in sheltered areas.

The island is made up of gently dipping carboniferous (Namurian) shales and sandstones, the Clare Shales series resting on Carboniferous limestone which, however, is not exposed on the island. Part of Foynes Island is listed as an area of scientific interest of national geological importance (Anon., 1981). There are substantial boulder clay deposits around Battery in the west and the Queen's Meadow in the east, also thinly elsewhere (Hodson, 1954; Hodson and Lewarne, 1961). Soils vary in thickness, and in the hollows drainage is impeded, leading to marshy vegetation. Away from such seepage areas, there is little standing or permanently running water.

While there is evidence of long human influence, Foynes Island has never been more than sparsely inhabited, and much of its gently sloping terrain was farmed into the 1950's. In recent years, bracken and scrub have progressively invaded the hill pastures. The non-calcareous rough grasslands are affected by a fluctuating rabbit population, subject to outbreaks of myxomatosis every few years.

The Shannon Estuary is earmarked as an industrial zone with plans for a new deepwater port. There has been port development at Limerick, Foynes and Shannon airport, and in recent years the construction of an alumina plant, jetty and storage area at Aughinish, 2.5km east of Foynes Island, and the commissioning of two oil/coal burning power-stations at Tarbert and Money Point, about 20km west (Figure 1). The island, centrally located, cannot avoid environmental influences of these developments, and because of its present relatively undisturbed condition, is thus in a good position for these effects to be monitored. The present checklist of vascular plants was compiled between 1983 and 1991, to provide a baseline for an area at once representative of west Limerick, and at the same time special in its settlement pattern and relative isolation.

Historical summary

There is evidence of human activity on the Island since the bronze age with the recent discovery of 11 ancient cooking places or fulachtaí fia (M. V. OBrien, pers. comm.). While about twelve house sites are identifiable, the oldest habitations appear to have been in the Blean area (8 on Figure 1), where there is a perennial water supply and a sheltered crossing. To the west, Battery was a site for gun emplacements in Napoleonic times.

In the mid nineteenth century there were major landscape changes in the south and east of the island with the construction of Monare and planting of woods and gardens, and farm developments at Barneen replacing an earlier, ruined house. The Stone Quay (22) was constructed about 1860, and a small pier was built in the 1930's at Barneen Point (4). Apple (1) and cherry orchards (10) were planted in the 1920's and 1930's respectively, a hay barn was constructed near Brishnehan's Gap (9) and the island was farmed actively up to about 40 years ago. Of six houses occupied 100

years ago, only two, Barneen and Monare, are still inhabited. Among the smaller holdings in the centre and west of the island, only Fitzsimons' (13) and Finucane's (12) were inhabited into the 1950s, while other houses close to Fitzsimons' were abandoned earlier. Cattle and sheep were held seasonally on the island until the mid 1980's. In the late 1960's the Cement Company constructed a now disused oil terminal jetty (5), storage tank and pipeline on the west side of the Island. Finally, in 1991, 60ha of the island was cleared of scrub, strip-ploughed and afforested with sitka spruce, pine and mixed hardwoods (see Figure 1).

Habitat description

The main habitats of interest are old meadow, semi-natural woodland, seepage areas, maritime short turf and saltmarsh; the island lacks bogland, good fens, limestone grassland or montane habitats.

Rough pasture on thin soils, sometimes invaded by bracken, covers much of the island. Scrub and thickets of *Ulex europaeus* and *Rubus*, others almost entirely of *Prunus spinosa*, have developed in what was formerly pasture, particularly in the centre and eastern part. Poorly drained areas have *Iris pseudacorus* and *Achillea ptarmica*, while by outcrops of shale and flagstone there is a dry turf community, with *Rumex acetosella*, *Sedum anglicum*, *Aphanes microcarpa*, *Festuca ovina*, *Hieracium pilosella*, *Carex caryophyllea* and *Galium saxatile*. Former arable land includes fields above and below Finucane's, probably worked until the mid 1950's, and fields around Fitzsimons'. Oats were grown in Parkawirig (19) until the mid-1920's, but this field has become invaded by bracken and brambles. A cherry orchard (10) near Parkawirig has been abandoned for many years and is now much overgrown.

The Queen's Meadow, a natural grassland on well-drained boulder clay, was cut for hay until the 1960's. The lawn at Barneen is an informal dry grassland in part on the site of an earlier house, while the lawn at Monare, on boulder clay and varying from damp to dry grassland, was cut for hay in the 1940's; it has a variety of dry or calcareous grassland species found infrequently elsewhere, such as Leucanthemum vulgare and Briza media. The adjoining Long Garden (15) is mown annually in midsummer and is noted for its orchids. The Apple orchard (1) at Monare, on boulder clay, is now invaded in parts by Rubus, Pteridium and Angelica sylvestris.

There are two extensive areas of mixed deciduous woodland, actively regenerating. The ground flora includes Luzula sylvatica, patches of Hyacinthoides non-scripta and scattered Epipactis helleborine. Ajuga reptans and Anemone nemorosa are uncommon. The North Wood (17) is an unmanaged woodland, with a significant amount of Pinus sylvestris, Betula pubescens and Sorbus aucuparia. The eastern part is marked on the 1841 O.S. map, but other areas are of more recent origin. The Long Wood (16) is a strip of mature mixed woodland on the eastern side of the island, planted before 1841. There are extensive patches of Allium ursinum, particularly close to Monare. The predominantly Beech Wood (7) is an immature wood planted around 1918; its ground flora includes Poa nemoralis and Neottia nidus-avis. The Big Blean Wood (8) is a small area of dense woodland developing from mixed scrub, and dominated by Salix cinerea. The alder swamps (2) are wooded slacks behind the gravel beach fringing the northwest and southeast corners of the Queen's Meadow; they contain Carex riparia and that to the north-west is the only site for Berula erecta.

While there is little standing or flowing water on the island, the nature of the soils and underlying rocks have led to springs and seepages in several places. Dihert (11) is the only permanent stream, rising from a spring about 50m from the head of the Big

Blean, and flowing through a marshy area before entering the Big Blean Wood. Elsewhere, intermittently flowing woodland springs and streams are characterised by Chrysosplenium oppositifolium.

A number of ill-defined or intermittent seepages drain the western slopes of the island, of which Parkawirig seepage (20) is the most substantial, with Potentilla palustris, Lycopus europaeus and tussocks of Molinia caerulea ssp. altissima. The best developed area of impeded drainage is near Brishnehan's Gap (9) on level high ground, with some organic accumulation over clay, and a rich flora including Deschampsia cespitosa, Molinia caerulea and Dactylorhiza spp. A comparable flora occurs near the southern shore at Barnadurta (3).

Battery pond (6), less than 10m in greatest dimension, is the only standing fresh water on the Island, although the area of open water varies from year to year. It was excavated in a low-lying, marshy area around 1967 during construction of the oil pipeline and jetty; in this area brick-clay had much earlier been dug for use at Barneen. The pond contains a stand of Typha latifolia and some Alisma plantago-aquatica, while beside it grows Carex laevigata.

Maritime species occur on the rocky promontories near Barneen and on the north side of the island. These promontories are topped by a short turf with occasional Erica cinerea. On Barneen Point (4) there is Arabidopsis thaliana, Erophila verna and Myosotis discolor. On northern promontories the turf is invaded by mixed scrub and some Calluna vulgaris. Shale cliffs occur around much of the island, generally topped by a thicket of Rubus, Hedera and Lonicera, with some Umbilicus rupestris and Rubia peregrina. Below the shale and elsewhere there are shingle shores colonised by Matricaria maritima, Atriplex spp. and Sonchus arvensis and occasionally, in seepage areas, Oenanthe crocata. Elymus

pycnanthus grows at the Queen's Meadow, and short turf on shingle contains Puccinellia maritima and Suaeda maritima.

Saltmarsh is best developed around the Queen's Meadow, with Triglochin maritima, Cochlearia officinalis and Carex extensa in a Festuca rubra turf. Juncus maritimus and Scirpus maritimus grow nearby. There are also small areas of saltmarsh in some bays, as at Little Blean (14), with Salicornia europaea. Remnants of more extensive saltmarsh on hummocks of clay, now largely eroded away, can be found on the shores southeast of the Queen's Meadow and southeast of Battery. Intertidal mud in the Big Blean and south of the Queen's Meadow is colonised by Spartina anglica (planted around 1930), and below Monare by Zostera angustifolia.

Among plants associated with habitation, Conium maculatum is conspicuous at Fitzsimons', Finucane's and Barneen. The small flower garden at Monare has Senecio vulgaris, Calystegia silvatica, Aegopodium podagraria and Capsella bursa-pastoris, weeds restricted or unknown elsewhere on the island. On a trackway beside the oil pipeline (21) Chamomilla suaveolens, Coronopus didymus and Polygonum aviculare are found, perhaps persisting from earlier arable weeds in this area. The most recent intervention was in the spring of 1991, when much of the hill, former tillage areas and the slope below Finucane's were planted with mixed conifers and deciduous trees. This process led to a rich development of arable weeds, many not before recorded during our survey (Reynolds and Reynolds, 1991).

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Check list of vascular plants

While individual records, notes and specimens exist, the only previous body of records of vascular plants for Foynes Island was made when C. G. O'Brien and M. C. Knowles listed 24 taxa during preparations for their Flora of the Barony of Shanid, that part of northwest Limerick which includes the island (O'Brien and Knowles, 1902-1906; Knowles and O'Brien, 1907).

The present survey was carried out between 1983 and 1991. The check list of 366 taxa includes 16 subspecies and 4 hybrids, almost entirely native and naturalised species. Five earlier records, not refound during this survey, are also listed. Deliberately planted species which have not spread are excluded. In the following check list, the nomenclature, arrangement of taxa and standard symbols (* certainly introduced, †† probably introduced, † possibly introduced into Ireland) follows Scannell and Synnott (1987). Plants were found and determined by the authors unless otherwise specified. Earlier records and 19 old and recent specimens deposited in the National Herbarium at Glasnevin (DBN) are noted. For widespread, common species an indication is given of their frequency on the island as a whole; for more localised plants, frequency is given in relation to sites. The notation "Arable weed (Reynolds and Reynolds, 1991)" refers to weeds noted in furrows after tree-planting in 1991. The sites mentioned are shown on Figure 1.

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Annotated list of vascular plants on Foynes Island

Equisetum arvense: occasional.
Polypodium interjectum: woods, on Quercus and Fraxinus; promontories; walls at Barneen; frequent.
Pteridium aquilinum: pastures and wood edges, abundant.
Phyllitis scolopendrium: woods, common.
Asplenium adiantum-nigrum: bank above Stone Quay and on shale north east of Battery, occasional.
A. ruta-muraria: walls at Monare.
A. trichomanes ssp. quadrivalens: walls at Monare.
Ceterach officinarum: walls at Monare.
Athyrium filix-femina: scrub edge near Dihert.
Polystichum setiferum: woods, common.
Dryopteris filix-mas: woods, common.
D. affinis: edge of bracken and brambles at Parkawirig.
D. dilatata: woods, common.
Blechnum spicant: woods, rare (E. Wiltshire, pers. comm.).
*Pinus sylvestris: common in North Wood, self-seeding; occasional in Long Wood.
Salix cinerea ssp. oleifolia: scrub and wood edges, common.
S. aurita: northwest edge of North Wood.
Betula pubescens: North Wood and scrub, frequent.
Alnus glutinosa: swamps at Queen's Meadow.
Corylus avellana: woods, occasional; edge of Long Wood above shore.
*Fagus sylvatica: woods, common.
Quercus petraea: Long Wood, rare.
Q. petraea x robur: woods, common.
Q. robur: woods, occasional.
Ulmus glabra: woods, frequent. Little evidence of Dutch Elm Disease in North Wood.
Urtica dioica: settlements and orchards, common.
Parietaria judaica: walls at Barneen.

Polygonum aviculare: shingle on north side; track along pipeline at Wreck Beach. Common arable weed (Reynolds and Reynolds, 1991).
P. hydropiper: wet and muddy places, common. O'Brien and Knowles (1902-1906). DBN, M. C. Knowles, 1905.
P. persicaria: occasional in disturbed ground. Common arable weed (Reynolds and Reynolds, 1991).
†P. lapathifolium: common arable weed (Reynolds and Reynolds, 1991).
Fallopia convolvulus: common arable weed (Reynolds and Reynolds, 1991).
Rumex acetosella: in short turf around outcrops, frequent.
R. acetosa: pasture, common.
R. crispus ssp. crispus: pasture, occasional.
R. crispus ssp. littoralis: shorelines, frequent (Reynolds, 1989). O'Brien and Knowles (1902-1906), as R. crispus var. littoreus, Foynes I. shore.
R. conglomeratus: frequent.
R. sanguineus: frequent.
R. obtusifolius: frequent.
Beta vulgaris ssp. maritima: shale and shingle near Monare, rare. O'Brien and Knowles (1902-1906), as B. maritima.
†Chenopodium album: common arable weed (Reynolds and Reynolds, 1991).
†Atriplex patula: common arable weed (Reynolds and Reynolds, 1991). O'Brien and Knowles (1902-1906).
A. prostrata: shorelines, common. Arable weed, occasional (Reynolds and Reynolds, 1991). DBN, M. C. Knowles, 1905, as A. Smithii; det. P. M. Taschereau as A. prostrata.
A. glabriuscula: shorelines; occasional. The distinction between A. prostrata and A. glabriuscula on the island shores is not always clear-cut. O'Brien and Knowles (1902-1906), as A. Babingtonii. DBN, M. C. Knowles, 1904, as A. Babingtonii; det. P. M. Taschereau as A. prostrata group.
Salicornia europaea s.s.: sparingly in mud between stones, Little

Blean.

S. fragilis: on an eroding clay hummock near Battery in 1984; rare (Reynolds, 1988). Site and plants since washed away.

Suaeda maritima: south shore at Queen's Meadow. O'Brien and Knowles (1902-1906).

Montia fontana ssp. variabilis: seepage areas in pasture, occasional; confirmed J. Parnell.

Arenaria serpyllifolia: walls at Barneen.

Moehringia trinervia: path in Long Wood near Monare and Queen's Meadow, occasional.

Stellaria media: by derelict buildings near Battery. Arable weed in 1991.

S. holostea: occasional.

S. alsine: damp areas in pasture, common.

S. graminea: pasture, common.

Cerastium fontanum: pasture, common.

C. glomeratum: tracks in pasture; gravel at Monare; occasional.

C. diffusum: short turf on promontories, frequent.

Sagina procumbens: frequent.

S. apetala: occasional.

††Spergula arvensis: arable weed, occasional (Reynolds and Reynolds, 1991).

Spergularia media: saltmarsh and eroded clay on shore, frequent.

S. marina: O'Brien and Knowles (1902-1906), as Buda marina var. neglecta. Not found during present survey.

Silene vulgaris ssp. maritima: on shingle near Monare in 1950's. Not found during present survey.

Anemone nemorosa: one small patch in Long Wood.

Ranunculus repens: common.

R. acris: frequent.

R. bulbosus: rare.

R. sceleratus: Queen's Meadow (O'Brien and Knowles, 1902-1906). Not found during present survey.

R. ficaria ssp. ficaria: woods, common.

R. flammula: common.
R. hederaceus: seepage areas in pasture, occasional.
*Fumaria bastardii: Barneen garden. Arable weed (Reynolds and Reynolds, 1991).
††F. officinalis: Barneen garden.
Sisymbrium officinale: one plant on top of shore at Wreck Beach in 1988. Arable weed, occasional (Reynolds and Reynolds, 1991).
Arabidopsis thaliana: short turf on Barneen Point; walls at Barneen; gravel at Monare.
Barbarea vulgaris: many plants on Barneen Headland; few plants by outcrops below Fitzsimons'.
Nasturtium officinale: Battery pond; Dihert; seepage area above Wreck Beach.
Cardamine pratensis: grassland by Long Wood at Monare.
C. flexuosa: common in wet areas in woods, pasture and top of shores; also Monare garden.
C. hirsuta: cliffs near Stone Quay; gardens at Monare and Barneen.
Erophila verna s.s.: short turf on Barneen Point, rare; det. T. T. Elkington.
Cochlearia officinalis s.s.: Little Blean, Queen's Meadow and Battery.
C. anglica: DBN, specimen of leaves only, M.C. Knowles, 1905. O'Brien and Knowles (1902-1906), Knowles and O'Brien (1907). Not found during present survey.
Capsella bursa-pastoris: gravel at Monare. Arable weed, occasional (Reynolds and Reynolds, 1991).
†Coronopus squamatus: arable weed above Fitzsimons', two plants (Reynolds and Reynolds, 1991).
††C. didymus: gravel at Monare; track along pipeline near Wreck Beach. Arable weed, occasional (Reynolds and Reynolds, 1991).
††Brassica rapa: arable weed, occasional (Reynolds and Reynolds, 1991).
*Raphanus raphanistrum ssp. raphanistrum: arable weed, one plant (Reynolds and Reynolds, 1991).

Umbilicus rupestris: shale cliffs, frequent.
Sedum acre: walls at Barneen.
S. anglicum: shale cliffs and outcrops in pasture, occasional; short turf on Barneen Point.
*S. album: short turf on Barneen Point.
Saxifraga tridactylites: walls at Barneen and shed roof at Monare.
Chrysosplenium oppositifolium: woods, locally common.
Filipendula ulmaria: damp grasslands, locally common.
Rubus adenanthoides: (Allen, 1990).
R. amplificatus: (Allen, 1990).
R. cardiophyllus: (Allen, 1990).
R. polyanthemus: (Allen, 1990).
R. ulmifolius: (Allen, 1990).
R. mutabilis: (Allen, 1990).
Rosa canina agg.: common. O'Brien and Knowles (1902-1906), as R. canina var. malmundariensis. DBN, M. C. Knowles, 1905, two specimens.
R. canina s.s.: near Barneen and shore northeast of Monare. Det. D. Doogue.
Agrimonia procera: Battery and Queen's Meadow, occasional elsewhere.
Geum urbanum: common.
Potentilla palustris: frequent in Parkawirig seepage (E. Wiltshire, pers. comm.).
P. anserina: damp pasture; saltmarsh at Little Blean and Queen's Meadow; common.
P. erecta: pastures and promontories on north side, common.
P. anglica: pastures, occasional.
P. reptans: top of shore northeast of Battery; occasional elsewhere.
P. sterilis: bank above Stone Quay; promontory on north side.
Aphanes microcarpa: in short turf by outcrops, occasional. Arable weed in 1991, occasional.
Malus sylvestris: occasional.

Sorbus aucuparia: North Wood and adjacent promontories, frequent.
*Cotoneaster spp.: C. cf. simonsii, one large bush; C. cf. microphyllus, several on north promontories; not planted.
Crataegus monogyna: common.
Prunus spinosa: thickets, common.
P. avium: edge of North Wood above shore, rare.
Ulex europaeus: promontories and thickets, frequent.
Vicia cracca: frequent.
V. sepium: frequent.
V. sativa ssp. nigra: Barneen Point, in short turf. Rare arable weed in 1991.
Lathyrus pratensis: common.
Medicago lupulina: frequent.
Trifolium repens: common.
T. hybridum: arable weed in Parkawirig, one plant (Reynolds and Reynolds, 1991).
T. dubium: frequent.
T. pratense: common.
Lotus corniculatus: promontories, frequent.
Oxalis acetosella: woods, frequent.
Geranium molle: short turf at Barneen; outcrops in pasture; occasional.
G. dissectum: occasional.
G. robertianum: common.
Linum catharticum: Monare garden.
††Euphorbia helioscopia: common arable weed (Reynolds and Reynolds, 1991).
††E. peplus: gardens at Monare and Barneen. Rare arable weed (Reynolds and Reynolds, 1991).
Polygala vulgaris: bank by path between Stone Quay and Monare.
*Acer pseudoplatanus: common.
*Aesculus hippocastanum: Long Wood near Monare.
Ilex aquifolium: common.
Euonymus europaeus: one tree on western edge of North Wood.

†Malva sylvestris: around Barneen.
Hypericum androsaemum: Long Wood, occasional.
H. pulchrum: near Stone Quay; shale northeast of Battery.
H. humifusum: outcrops near Big Blean, rare.
H. tetrapterum: frequent.
H. maculatum: occasional.
Viola reichenbachiana: bank by path near Stone Quay.
V. riviniana: woods and pastures, common.
V. arvensis: arable weed, one plant below Finucane's (Reynolds and Reynolds, 1991).
Lythrum salicaria: Queen's Meadow; occasional elsewhere.
L. portula: muddy seepage areas, occasional.
Circaea lutetiana: woods, common.
Epilobium hirsutum: by oil tank near Battery.
E. parviflorum: near Monare.
E. montanum: woods and Monare garden, common.
E. obscurum: damp areas, occasional.
E. palustre: near Parkawirig, rare.
*Cornus sericea: thicket on shoreline north east of Battery (Reynolds, 1988; Kelly, 1990).
Hedera helix: common.
Hydrocotyle vulgaris: damp slope above Wreck Beach.
Sanicula europaea: North Wood, occasional.
Anthriscus sylvestris: Barneen.
Conopodium majus: pastures, common.
*Aegopodium podagraria: gardens at Monare and Barneen.
Berula erecta: alder swamp at north western corner of Queen's Meadow (E. Wiltshire, pers. comm.).
Oenanthe crocata: head of Big Blean and alder swamps at Queen's Meadow; occasional in seepage areas at top of shore; Battery pond.
††Aethusa cynapium: rare arable weed (Reynolds and Reynolds, 1991).
Conium maculatum: Barneen, Finucane's, Fitzsimons' and shoreline at Queen's Meadow. O'Brien and Knowles (1902-1906).

Apium nodiflorum: Dihert; seepage areas above Wreck Beach and near Fitzsimons'; Battery Pond.
Angelica sylvestris: abundant in orchard at Monare; occasional elsewhere.
Heracleum sphondylium: frequent. Plants with purple flowers and stems in Queen's Meadow.
Torilis japonica: occasional.
Erica cinerea: promontories, frequent.
Calluna vulgaris: promontories on north side, occasional.
Primula vulgaris: woods, occasional.
P. veris: grassland at Barneen and below Fitzsimons', rare.
P. veris x vulgaris: several plants on Barneen lawn.
Lysimachia nemorum: occasional.
Glaux maritima: shores; common in saltmarsh at Little Blean and Queen's Meadow. O'Brien and Knowles (1902-1906).
Anagallis arvensis: occasional. Arable weed (Reynolds and Reynolds, 1991).
Samolus valerandi: saltmarsh at Little Blean and Queen's Meadow.
Armeria maritima: promontories and saltmarsh, frequent.
Limonium humile: saltmarsh at Queen's Meadow, occasional elsewhere. O'Brien and Knowles (1902-1906), as Statice rariflora.
Fraxinus excelsior: woods, frequent.
Centaurium erythraea: promontories and dry banks above shore at Battery, occasional.
Sherardia arvensis: near Barneen.
Galium palustre s.s.: wet areas in pasture, common.
G. verum: promontories, frequent.
G. saxatile: short turf on hill, common.
G. aparine: common; also top of shore on northern side.
Rubia peregrina: coastal thickets, frequent.
Calystegia sepium: frequent.
*C. silvatica: Monare garden (Reynolds, 1988).
Myosotis arvensis: frequent.
M. discolor: short turf on Barneen Point and at Barneen.

M. secunda: wet places on hill, frequent.
M. laxa: damp area near Battery pond and muddy gateway below Fitzsimons', occasional. DBN, M. C. Knowles, 1905, as M. repens (= M. secunda); det. M. B. Telford as M. caespitosa (= M. laxa).
Callitriche stagnalis s.s.: wet, muddy places in pasture and Battery pond, frequent.
Ajuga reptans: wood edges and shady places, occasional.
Teucrium scorodonia: common.
†Galeopsis tetrahit: arable weed, large patch in Parkawirig (Reynolds and Reynolds, 1991).
Lamium purpureum: Monare. Arable weed, occasional (Reynolds and Reynolds, 1991).
Stachys sylvatica: frequent.
S. palustris: occasional.
*S. arvensis: few plants in cattle-trampled area northeast of Battery.
Glechoma hederacea: wood edges and thickets, frequent.
Prunella vulgaris: common. Pink and white colour variants on path between Monare and Stone Quay.
Lycopus europaeus: wet areas in pasture, occasional. O'Brien and Knowles (1902-1906).
Mentha aquatica: frequent.
M. aquatica x arvensis (M. x verticillata): damp pasture west of North Wood; occasional elsewhere. Det. R. M. Harley.
Solanum dulcamara: shorelines, occasional.
Scrophularia nodosa: occasional. Arable weed in heavy soil, occasional (Reynolds and Reynolds, 1991).
S. auriculata: less frequent than S. nodosa.
Digitalis purpurea: frequent.
Veronica serpyllifolia: occasional. DBN, Miss [C. G.] O'Brien, 1902.
V. officinalis: frequent in short turf on hill; shale slope north east of Battery jetty.
V. chamaedrys: common.

V. montana: woods, occasional.
V. scutellata: Parkawirig seepage.
V. arvensis: frequent. Arable weed in 1991, occasional (Reynolds and Reynolds, 1991).
†V. agrestis: near Barneen (Reynolds, 1988). Several plants by rock outcrop above Fitzsimons' (Reynolds and Reynolds, 1991).
*V. persica: garden at Monare. Arable weed, occasional (Reynolds and Reynolds, 1991).
†V. hederifolia ssp. hederifolia: garden and beech wood at Monare, common.
Euphrasia officinalis s.l.: common in pasture near Battery pond; occasional elsewhere. DBN, C. G. O'Brien, 1903; det. Fredk. Townsend as E. brevipila. Knowles and O'Brien (1907), as E. brevipila.
E. cf rostkoviana: damp pasture southeast of North Wood.
Odontites verna ssp. serotina: dry ground near Battery jetty; occasional elsewhere.
Pedicularis sylvatica: short turf on hill, occasional.
*Orobanche minor: few plants at Barneen.
O. hederae: Long Wood, rare.
Plantago major: occasional.
P. coronopus: promontories, common.
P. maritima: saltmarshes, common. O'Brien and Knowles (1902-1906).
P. lanceolata: common.
Sambucus nigra: common.
Lonicera periclymenum: common.
Dipsacus fullonum: low banks above shore at Wreck Beach and Battery, common.
Succisa pratensis: common in damp grassland; also on promontories.
Bellis perennis: frequent.
Aster tripolium: saltmarshes, common. O'Brien and Knowles (1902-1906).
Gnaphalium uliginosum: trampled areas on hill, occasional. Arable weed on heavy soil (Reynolds and Reynolds, 1991).

Pulicaria dysenterica: frequent on slope above Wreck Beach; also damp pasture southeast of North Wood.
Achillea ptarmica: common on slope above Wreck Beach; occasional elsewhere.
A. millefolium: common. Occasional patches of plants with dark pink flowers.
Matricaria maritima agg.: prostrate plants common on shores; more erect plants along pipeline track; gland shape on achenes variable in both. Occasional plants with round glands, cf M. perforata, among arable weeds in 1991.
*Chamomilla suaveolens: along pipeline track.
†Chrysanthemum segetum: rare arable weed (Reynolds and Reynolds, 1991).
Leucanthemum vulgare: lawns at Monare and Barneen; pasture above Barneen; rare.
Artemisia maritima: small patch of plants beside Stone Quay; formerly also known on southern shore of Queen's Meadow in the 1930's (E. Wiltshire, pers. comm.).
Tussilago farfara: bank at Battery; top of shore on northern side.
Senecio jacobaea: common.
S. aquaticus: Parkawirig seepage and wet area near Fitzsimons', rare.
S. vulgaris: Monare garden.
Arctium minus agg.: Barneen and Finucane's; occasional elsewhere.
A. minus s.s.: one plant on ridge east of Parkawirig.
Cirsium vulgare: frequent.
C. palustre: frequent.
C. arvense: common.
Centaurea nigra: occasional.
Hypochoeris radicata: common.
Leontodon autumnalis: frequent in grassland; also saltmarsh at Queen's Meadow.
L. taraxacoides: dry banks at Battery.
Sonchus asper: Barneen; occasional elsewhere. Arable weed

(Reynolds and Reynolds, 1991).
S. oleraceus: Barneen; occasional elsewhere. Arable weed (Reynolds and Reynolds, 1991).
S. arvensis: top of shore, frequent.
Taraxacum officinale agg.: common.
Lapsana communis: frequent.
Crepis capillaris: frequent.
*C. vesicaria: occasional.
Hieracium pilosella: promontories and outcrops, frequent.
H. pilosella ssp. pilosella: ridge east of Parkawirig.
H. pilosella ssp. tricholepium: Barneen Point.
*Helianthus annuus: many plants on shingle at Monare in 1987 (Reynolds, 1988).
Alisma plantago-aquatica: Battery pond.
Triglochin maritima: saltmarshes, frequent.
Zostera angustifolia: on tidal mud below Monare.
Hyacinthoides non-scripta: woods; small patches among bracken on hill.
Allium ursinum: Long Wood, abundant particularly in southern half.
*Tamus communis: in beech hedge by path between Monare and Stone Quay.
†Iris foetidissima: few plants around Barneen. Knowles and O'Brien (1907).
I. pseudacorus: common.
Juncus maritimus: saltmarshes and seepage areas on shoreline, frequent.
J. inflexus: occasional.
J. effusus: common.
J. conglomeratus: Barnadurta, rare.
J. gerardi: saltmarshes and seepage areas on shoreline, common.
J. foliosus: wet mud near Dihert (Reynolds, 1988); DBN, S. Reynolds, 1987.
J. bufonius s.s.: Battery pond, muddy tracks and damp areas, common.

J. acutiflorus: common.
J. acutiflorus x articulatus (J. x surrejanus): slope above Wreck Beach, frequent.
J. articulatus: shoreline seepage areas on northern side. DBN, Miss [C. G.] O'Brien, 1902, as J. lamprocarpus.
Luzula campestris: common in short turf by outcrops; Monare lawn.
L. multiflora: Brishnehan's Gap; Barnadurta; occasional.
L. sylvatica: woods, common.
Festuca gigantea: woods near Monare and Queen's Meadow, occasional.
F. pratensis: Queen's Meadow.
F. rubra: cliffs and promontories; hill pasture; stony shore at Queen's Meadow; common. DBN, C. G. O'Brien, 1905, as F. duriuscula var. glauca; det. M. Wilkinson, 1984, as F. rubra.
F. ovina: Barneen Point; ridge east of Parkawirig; occasional. O'Brien and Knowles (1902-1906), as F. ovina var. glauca.
Lolium perenne: occasional.
Vulpia bromoides: dry slopes near Barneen.
Desmazeria rigida: promontories, occasional.
Poa annua: common.
P. trivialis: common.
P. subcaerulea: short turf on Barneen headland (Reynolds, 1988). DBN, S. Reynolds, 1987.
P. pratensis s.s.: common.
††P. nemoralis: Beech Wood near Monare.
Puccinellia maritima: saltmarshes, frequent. Plants stoloniferous and prostrate.
Dactylis glomerata: common.
Cynosurus cristatus: common.
Briza media: Monare lawn.
Glyceria fluitans: Battery pond and wet areas on hill, occasional.
Bromus ramosus: woods, frequent.
B. hordeaceus: four plants on shoreline near Battery, August 1987.
Brachypodium sylvaticum: common.

Elymus pycnanthus: common on top of shore at Queen's Meadow.
E. repens: top of shore, frequent; also near Barneen. Arable weed in 1991. Plants with awned lemmas at Stone Quay, top of shore at Wreck Beach and Battery. O'Brien and Knowles (1902-1906) as Agropyron repens var. barbatum. DBN, Foynes I. shore, C. G. O'Brien, 1905, as Triticum repens var. barbata? The specimen has short awns.
Elymus farctus x pycnanthus: O'Brien and Knowles (1902-1906), Knowles and O'Brien (1907), as Agropyron acutum; supporting specimen in DBN, C. G. O'Brien, 1905, as Triticum acutum; DBN specimen has not been critically determined. E. farctus has not been recorded for Co. Limerick.
Arrhenatherum elatius: frequent. Basal internodes of plants in former arable land distinctly swollen and corm-like.
Koeleria macrantha: promontories, frequent; also in short turf on hill.
Trisetum flavescens: Barneen lawn, rare.
Deschampsia cespitosa: Brishnehan's Gap; Barnadurta; occasional elsewhere.
Aira praecox: Barneen headland in short turf; outcrop above Fitzsimons'; occasional elsewhere.
A. caryophyllea: promontories, occasional.
Anthoxanthum odoratum: common.
Holcus lanatus: common.
H. mollis: Barneen, under pines.
Agrostis capillaris: common.
A. stolonifera: saltmarshes; shoreline seepage areas; Battery pond and other wet places; common.
Alopecurus pratensis: frequent.
A. geniculatus: Parkawirig seepage; occasional elsewhere.
Danthonia decumbens: Brishnehan's Gap, rare.
Molinia caerulea: Brishnehan's Gap; promontory on northern side.
M. caerulea ssp. altissima Link (Domin.): Parkawirig seepage (Reynolds, 1989). DBN, S. and J. Reynolds, 1987.

*Spartina anglica: Big Blean and S of Queen's Meadow, planted c.1930; few plants in Little Blean. Reynolds (1988). DBN, S. Reynolds, 1987.
*Setaria viridis (L.) Beauv.: one plant on shingle at Monare in 1989 (E. Wiltshire, pers. comm.).
Arum maculatum: frequent. Plants with black-spotted leaves under beech near Monare. O'Brien and Knowles (1902-1906).
Lemna minor: Battery pond.
Typha latifolia: Battery pond.
Scirpus maritimus: saltmarsh at Queen's Meadow; Big Blean; top of shore near Battery.
S. setaceus: Dihert.
Eleocharis palustris: Brishnehan's Gap.
E. uniglumis: saltmarsh at Queen's Meadow.
Carex otrubae: top of shore in Little Blean and at Battery. DBN, Denis Gwynn, 1905, as C. vulpina.
C. divulsa ssp. divulsa: Barneen; hedgerows near Monare; occasional elsewhere.
C. disticha: damp bottom of slope at Wreck Beach; near Battery pond.
C. remota: woods, occasional; near Dihert.
C. ovalis: hill pasture, occasional.
C. hirta: Brishnehan's Gap; one patch southwest of Fitzsimons'.
C. riparia: head of Big Blean; alder swamp at northwestern corner of Queen's Meadow. O'Brien and Knowles (1902-1906).
C. sylvatica: woods, common.
C. flacca: Barnadurta; banks at Battery; slope above Wreck Beach; occasional.
C. panicea: Barnadurta; Brishnehan's Gap; occasional.
C. laevigata: several plants at Battery pond.
C. binervis: Barnadurta; promontory on northern side; Brishnehan's Gap; occasional elsewhere.
C. extensa: saltmarsh at Queen's Meadow; on tidal mud in Big Blean; promontories on northern side.

C. demissa: Barnadurta, rare.
C. caryophyllea: short turf by outcrops on hill, occasional.
C. nigra: Brishnehan's Gap, occasional.
Epipactis helleborine: woods, occasional. DBN, H. M. V. OBrien, 1953.
Neottia nidus-avis: Beech Wood near Monare.
Listera ovata: Long Garden at Monare.
Platanthera chlorantha: rough pasture near bracken, rare.
Dactylorhiza maculata group: frequent in Long Garden at Monare and near Brishnehan's Gap; occasional at Queen's Meadow and elsewhere. Plants very variable (labella shape variable in any one spike) and not clearly separable to species; approaching D. fuchsii at Monare, and D. maculata near Brishnehan's Gap.
Anacamptis pyramidalis: Long Garden at Monare and Barneen lawn, frequent.
Ophrys apifera: few plants on Barneen lawn in 1980.

Discussion

The 361 taxa recorded for Foynes Island between 1983 and 1991 represent about 45% of that known for Co. Limerick, excluding deliberate introductions and casual species. A century earlier S. A. Stewart (1890) recorded c.480 taxa from both sides of the Shannon Estuary. Although he did not visit the island, he listed about 60 species from the Foynes area which also occur on Foynes Island today. Knowles and O'Brien (1909) listed the more interesting plants from a number of islands off the Clare shore of the estuary 5km to the northeast. These islands are chiefly limestone, and their calcicole flora has few resemblances to that of Foynes Island, although their saltmarsh and shoreline vegetation is similar.

Most of the island plants are relatively common elsewhere in Limerick, and there are few species of special interest although

some were found only in small numbers. Of particular interest are Hypericum humifusum, Orobanche minor, Veronica agrestis, Artemisia maritima, Zostera angustifolia, Neottia nidus-avis and Ophrys apifera because they are considered rare or have a restricted distribution in Ireland (Webb, 1977).

The relatively few weedy species were restricted to gardens, e.g. Senecio vulgaris at Monare and Fumaria spp. at Barneen, or where the soil had been disturbed in laying the pipeline, e.g. Chamomilla suaveolens. Until the tree planting and accompanying soil disturbance in 1991 such ubiquitous weed species as Chenopodium album and Atriplex patula were not found during the survey, although both are common on the mainland, and A. patula had been noted on the island about 90 years earlier (O'Brien and Knowles, 1902-1906). The absence of Phleum pratense suggests that grasslands were not reseeded.

Deliberate introductions such as Hypericum calycinum near Monare and Populus canescens at Finucane's have increased only locally. The two Cotoneaster species were probably bird-sown and a piece of Cornus sericea may well have been washed ashore initially, but none of these have become more widely established. Clematis vitalba is abundant across the water in Foynes, but has not yet reached the island. Occasionally exotic annuals have grown for a season on the shore; in recent years high tides lapped around many plants of Helianthus annuus and one plant of Setaria viridis.

During the period of the survey one saltmarsh species, Salicornia fragilis was lost due to erosion of its habitat. Earlier records for Spergularia marina, Ranunculus sceleratus, Cochlearia anglica (O'Brien and Knowles, 1902-1906) and Silene vulgaris ssp. maritima (known in the 1950's) were not confirmed. Of these, S. marina is on nearby Sturamus Island, R. sceleratus occurs at Foynes and S. vulgaris ssp. maritima and C. anglica can be found further up the

Shannon estuary. Artemisia maritima, now only at one site, was known at the Queen's Meadow in the 1930's (E. Wiltshire, pers. comm.), but it is still common 2km southeast of the island near the mouth of the Robertstown River. Some at least of these losses are related to the erosion of saltmarsh around the island, which may reflect dredging or increased port activity.

The existing woodland habitats, maritime short turf, saltmarsh, old meadow and some wet areas were untouched by the extensive planting in 1991 and the majority of the flora should persist unless the island itself is further developed or there are changes due to external influences, such as acid precipitation, water pollution or further erosion. In connection with existing lists of mammals and birds (M. V. OBrien, pers. comm.), and an ongoing survey of the bryophytes (E. Wiltshire, pers. comm.), the island database should provide a valuable reference point against which to measure future changes.

Dedication and Acknowledgements

We dedicate this paper to Professor David Webb on the occasion of his 80th birthday. He introduced us to the complexities of the Irish flora and has encouraged our interest ever since. We would particularly like to thank Sylvia's parents, Suzanne and Murrogh OBrien, and aunt, Elinor Wiltshire, for their hospitality, interest and valued scientific input; also Maura Scannell for bringing the O'Brien and Knowles annotated London Catalogue to our attention.

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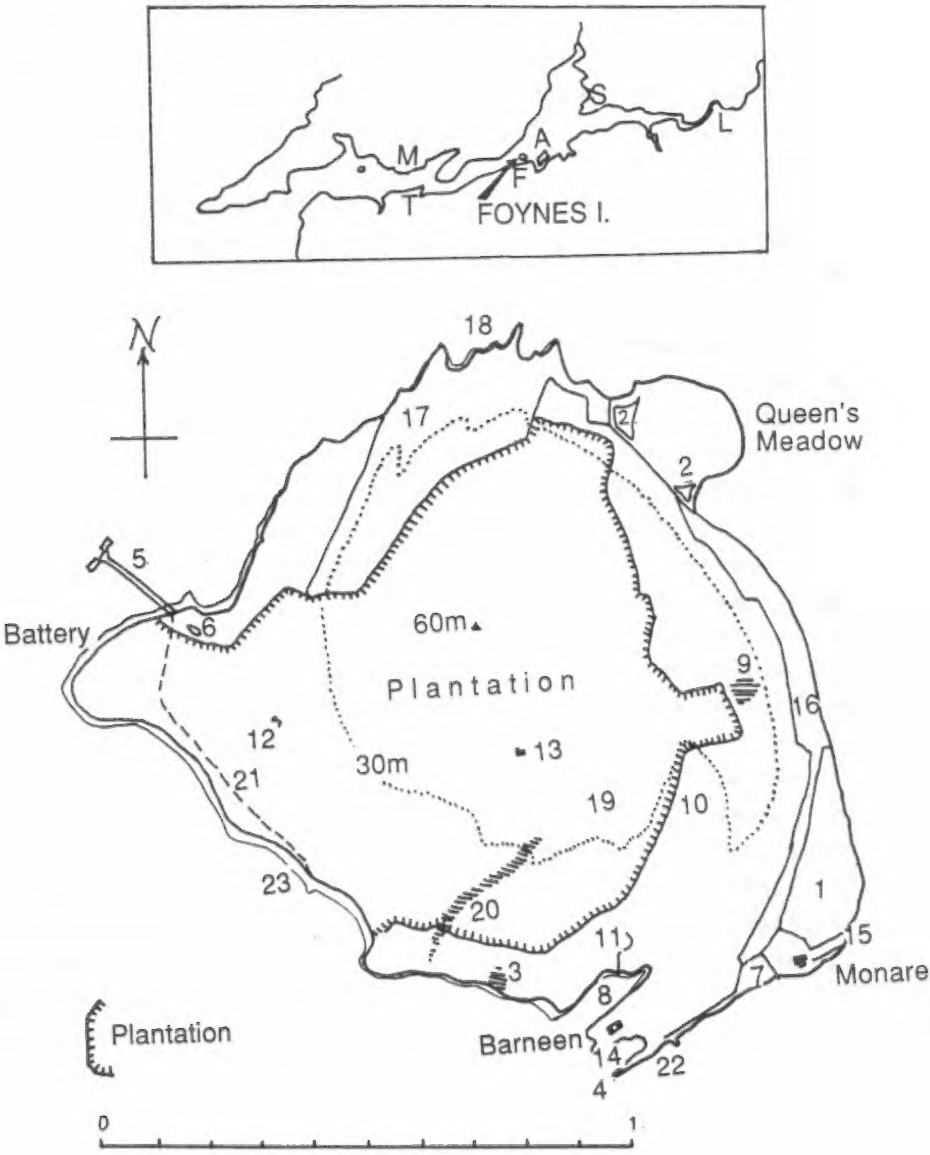
FIGURE 1. Map of Foynes Island, Co. Limerick, showing sites mentioned in the text.
Inset shows the position of Foynes Island relative to industrial sites in the Shannon Estuary.



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List of sites numbered and lettered on Figure 1.

A. Aughinish Alumina.
F. Foynes port.
L. Limerick city.
M. Money Point power station.
S. Shannon Airport.
T. Tarbert power station.

1. Apple orchard.
2. Alder swamps.
3. Barnadurta seepage.
4. Barneen Point.
5. Battery jetty.
6. Battery pond.
7. Beech Wood.
8. Big Blean.
9. Brishnehan's Gap.
10. Cherry Orchard.
11. Dihert (Tubber na Dihert).
12. Finucane's.
13. Fitzsimons'.
14. Little Blean.
15. Long Garden.
16. Long Wood.
17. North Wood.
18. Northern promontories.
19. Parkawirig.
20. Parkawirig seepage.
21. Pipeline.
22. Stone Quay.
23. Wreck Beach.

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THE IMMIGRANT BARNACLE, ELMINIUS MODESTUS DARWIN, IN GALWAY BAY, IRELAND

David McGrath and Pauline King

Elminius modestus Darwin is an estuarine barnacle which was found, prior to the 1940's, in New Zealand and Australia, but which has since become well established and widespread in European waters (Flowerdew, 1984). This barnacle species first appeared in European waters on the south coast of England in the 1940's and is believed to have been brought there by shipping in the early years of the second world war (Crisp, 1958). Since that time it has extended its range, through shipping and the natural drift of larvae along the coast, respectively known as remote and marginal dispersal (Crisp, 1958). It is now known from Shetland in the north to north-west Spain and Portugal in the south, including the coasts of Ireland, Britain, Holland, Germany and France (Flowerdew, 1984).

E. modestus was not found during surveys of shores around the entire Irish coast in 1952 or between Lough Foyle and Dublin in 1953 (Crisp and Southward, 1959). It was first recorded in Irish waters by Beard (1957), who found small numbers of the species on shores outside Lough Ine, Co. Cork. Later surveys by Crisp and Southward in 1958 and 1959 showed that E. modestus had colonised a number of areas (Crisp and Southward, 1959). These were: Larne Harbour to Newcastle, Co. Down with dense populations in Belfast and Strangford Loughs, thinly settled areas from Dundalk to Port Oriel and from Skerries to Howth, on the east coast, and from Ardmore, Co. Waterford to Lough Ine on the south coast, with the species common only in the sheltered bays and channels of Cork Harbour. The whole of the west coast, from Lough Ine to Lough Foyle, and the east and south coasts from Howth to Ardmore were apparently free of the species (Crisp and Southward, 1959). Crisp

and Southward (op. cit.) did not regard E. modestus as having established itself in Lough Foyle as only three old specimens were found on piles marking the channel.

A survey of shores in the Kenmare River in May 1959 failed to find the species there (Arnold, 1960).

In 1966, E. modestus was present in the harbour at Schull, Co. Cork, but the species was not found at Glengarriff Harbour. However, in 1968, it was found at a number of sites in the Glengarriff and Bantry Bay areas (Crapp, 1973). Surveys in February 1972 showed that Elminius was well established in Roaringwater Bay and was present in Dunmanus Bay, but was absent from a number of shores examined along the southern shore and head of the Kenmare River (Crapp, 1973). Ryland and Nelson-Smith (1975) note that the species "has not yet colonised the major part of Ireland's west coast" and did not record it during their survey work on shores in Cos Galway and Clare. During the period 1978-1980, a single specimen of E. modestus was found at Mt. Trenchard, on the southern shore of the Shannon Estuary, and, by 1983, the species had been observed north of the Shannon at Kilkee, Co. Clare (O'Sullivan, 1983). In 1989, one of the authors (DMcG) found Elminius at Tarbert, also on the southern shore of the Shannon estuary.

Further published records of E. modestus from Irish waters include the following: Strangford Lough (Boyd, 1973; Seed and Harris, 1980), Ardglass, Co. Down (Aitken and Hillis, 1959), Lough Ine (Holmes, 1980), Bantry Bay (Baker et al., 1981), and Lough Foyle, on mussels (Briggs, 1982). In 1977, it was found to be common in Bannow Bay, Co. Wexford and a single individual was recorded at Carnsore Point (Brenda Healy, pers. comm.). A single specimen was found at Blennerville Bridge, Co. Kerry in the mid 1970's and the species has become common in Tralee Bay in recent years (Colm

Duggan, pers. comm.). E. modestus is now common in the vicinity of the pier at Castlepark, Kinsale, Co. Cork (authors' observations) and is also common in Carlingford Lough (B. Healy, pers. comm.), an area where it was reported as absent in 1958 by Crisp and Southward (1959).

Thus, by 1983, E. modestus had been recorded on the Irish coast from Lough Foyle in the north, around the north-east, east, south and west coasts as far north as Kilkee, Co. Clare.

On 20 March 1989, while carrying out routine shore studies at Ballyloughane, Co. Galway (53°15.9'N 9°1'W), a number of specimens of E. modestus were found. The species was present as small widely scattered individuals on rocks around the mid-shore among dense populations of the barnacle Semibalanus balanoides (L.). The shore itself lies some 1.5km east of Galway City and Harbour and consists of large rocks set into a muddy sediment. It would be classified as a sheltered rocky shore (grade 6) on the Ballantine (1961) scale. The size of the barnacles and their very sparse distribution suggested that they were recent colonists. On 5 December 1990, small numbers of widely scattered individuals were again recorded at Ballyloughane and were also found on the shore on the west side of Nimmo's Pier (53°16'N 9°2.9'W) on rocks and live mussel (Mytilus edulis L.) shells. None were found during searches of the rocky shores along Seapoint Promenade.

These records extend the known range of E. modestus along the Irish west coast. The origin of the population at Ballyloughane and Nimmo's Pier, whether the species arrived by marginal or remote dispersal, must await further more detailed studies of its distribution on the shores of Cos Galway and Clare. The discovery of the species on these shores close to Galway Harbour suggests that it may have been transported by shipping.

Since this paper was completed, E. modestus was found at two localities north of Galway Bay as follows:-
Old Head, Clew Bay, Co. Mayo, small numbers among more abundant S. balanoides on rocks at the pier end of the sandy beach on 26 April 1992 and Cleggan Pier, Co. Galway, a single specimen on the harbour wall on 29 June 1992.

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A PROVISIONAL LIST OF THE IRISH DIAPRIINAE (HYMENOPTERA: DIAPRIIDAE)

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Abstract

The Irish Diapriinae (Hymenoptera, Diapriidae) are reviewed. The present list contains 68 species, of which 34 species are new to Ireland. One species, Idiotypa rufiventris (Thomson), is restored to the British Isles list. Data are given on the distribution and flight-periods of the Irish species.

Introduction

The Diapriidae is a large family of relatively obscure insects. It is currently divided in four subfamilies, three of which occur in the British Isles. Stelfox (1966) gives a checklist of the Ismarinae and Belytinae but none exists for the Diapriinae. Despite the fact that the Diapriidae is one of the larger families of parasitic Hymenoptera in the British Isles, that many species are extremely common and that there are good keys to the British species, virtually nothing is known about their life history. The few records there are suggest that most diapriids are endoparasitoids that develop in dipterous pupae. Many diapriines are gregarious endoparasitoids. Some are hyperparasitoids. Species of Trichopria have been reared from tachinid puparia found inside their hosts. A species of Psilus is a primary parasitoid of tephritid puparia, but will develop as a facultative hyperparasitoid within larvae of Opius (Braconidae) or Tetrastichus (Eulophidae) developing in the primary host (Gauld and Bolton, 1988).

Haliday (1857) published the first Irish data on this group. In

his paper, he reviewed the species then known from the British Isles. He described two valid genera (Corynopria Haliday and Labolips Haliday) and four valid species (Corynopria cincta Haliday, Entomacis perplexa (Haliday), E. platyptera (Haliday) and Labolips innupta Haliday) new to science. Unfortunately, in his paper, L. innupta is the only species definitely recorded from Ireland. Morley (1911) reported the genus Diapria from Clare Island and Westport, Co. Mayo, but did not identify the material to species. Nixon (1980) published a key to most of the species in the British Isles and included Irish records. In the present text, this work is referred to as "Nixon". Similarly, Kieffer (1916), Hellén (1963) and Kozlov (1988) are cited respectively as "Kieffer", "Hellén" and "Kozlov". Due to the recent breakup of the U.S.S.R., we have recognised the various independent republics where relevant.

The authors have examined a representative sample from the collection formed by the late A. W. Stelfox and identified by Nixon. It was returned to the National Museum of Ireland by the Smithsonian Institution (Beirne, 1985). In addition, over a number of years, J. P. and M. A. O'Connor collected numerous specimens in many parts of Ireland. These and miscellaneous specimens already in the National Museum have also been included. All the above material was identified by the authors using Nixon. In certain instances, Kieffer and Kozlov were also used. Voucher specimens from the O'Connor Collection have been deposited in the National Museum of Ireland.

Nomenclature follows that of Nixon but this does not correspond to the checklist given by Fergusson (1978). Nixon considered that the latter contained many species names that were likely to be misidentifications or at any rate would require prolonged investigation. One of these species, Idiotypa rufiventris (Thomson) is restored to the checklist by the present authors.

Since publication of Nixon's key, Aneuropria foersteri (Kieffer) and Viennopria priesneri Jansson has been added to the British fauna (Prance, 1991; Notton, 1992). Species new to Ireland are indicated by *. The following abbreviations are used in the text:- RB - R. E. and R. M. Blackith, MB - M. Boston, EFB - E. F. Bullock, JNH - J. N. Halbert, GEJN - G. E. J. Nixon, JMOC - J. P. and M. A. O'Connor, JPOC - J. P. O'Connor, EOM - E. O'Mahony, MCDS - M. C. D. Speight, AWS - A.W. Stelfox.

Checklist of Irish species

ANEURHYNCHUS Westwood
Thirteen species recorded in Britain with eight known from Ireland.

A. ariadne Nixon
This species is known from Britain (Devon, Herts and Northants) and from Ireland (four Irish specimens viz. 1♀ (Dublin or Wicklow) and 3♂♂ (Donegal, Wexford and Wicklow)) (Nixon). It is evident from the relevant Stelfox diary that the ♀ was taken in a car on an outward and return journey between Dublin and Wicklow. The record from Donegal is incorrect and should read Down. In addition, the year is incorrectly cited. The species is also known from England and France (Nixon).
DOWN: Drinnahilly, 16.vi.1963; DUBLIN/WICKLOW: 12.vii.1931; WEXFORD: Ards, 17.vi.1965; WICKLOW: Devil's Glen, 18.vi.1950. All AWS.

*A. galesiformis Westwood
This is the most commonly taken species of Aneurhynchus in Britain and is widely distributed. It has been bred from puparia of Fannia sp. (Diptera) living in wet detritus beneath a nest of Vespa crabro L. (Hymenoptera) (Nixon). Also recorded from northern and central Europe including Russia (St. Petersburg (Leningrad) and

Yaroslav districts) (Hellén, Kozlov).
CARLOW: Cloughristick wood (S7069), 19.vi.1982, JMOC, mixed woods on the banks of the River Barrow; DOWN: Newcastle, 10.ix.1955, AWS; DUBLIN: Clonskeagh, 6.vii.1942; Glenasmole, 19.viii.1942; Harold's Cross, 18.viii.1942, all AWS; KILDARE: Rye Water, 16.viii.1942, AWS; SLIGO: Trawallua, 26.vii.1933, AWS.

*A. gracilicornis Wall
Widespread in Britain and one of the commonest species of the genus. The female is unknown and this species could be the male of A. pentatomus Thomson (Nixon).
KERRY: Blue Pool, Killarney (V9886), 30.viii.1987, JPOC; WEXFORD: Oaklands Wood (S7125), 18.vi.1982, JMOC, mixed woods; WICKLOW: near Calary Lower (O2311), 22.viii.1988, JPOC, small marsh.

A. longicornis Thomson
Nixon reports a ♂ from Westmeath and a ♂ from Dublin. He also gives records from England and Sweden.

A. obliquus Kieffer
Nixon records a ♂ from Westmeath. He also records it from England, Germany and Scotland. Possibly the male of A. oviventris Thomson.

*A. oviventris Thomson
Also known from England, France and Sweden (Nixon).
DUBLIN: Killakee, 21.x.1954, AWS.

A. pentatomus Thomson
Nixon merely states "Ireland". Also known from England, Finland, France, Italy and Sweden (Hellén). Kozlov mentions Russia (St. Petersburg (Leningrad) district).
WICKLOW: Athdown, 2.x.1954, AWS.

*A. ruficornis Thomson
Bred from puparia of Platypeza fasciata Meigen (Diptera) in England (Nixon). Also known from Denmark, Finland, Scotland and Sweden (Hellén). Kozlov mentions Russia and Moldavia.
DUBLIN: Ballyscorney, 12.viii.1953; Slade Brook, 21.ix.1941; WICKLOW: Devil's Glen, 29.ix.1954; Leitrim B., 11.viii.1940. All AWS.

BASALYS Westwood
Twenty-seven species recorded from Britain with sixteen known from Ireland.

*B. abrupta Thomson
Common and widespread in Britain (Nixon). Also known from Finland and Sweden (Hellén).
DONEGAL: Knader, 9.viii.1933, AWS; DOWN: Donard Lodge, 21.x.1958, AWS; DUBLIN: The Slade of Saggart, 12.viii.1936, AWS; Castleknock (O089377), Malaise trap 8.viii-8.ix.1984, JMOC, suburban garden; KILDARE: Skerries Bog, 19.ix.1946, AWS; Louisa Bridge (N9936), 2.viii.1982, JMOC, marshy area; WESTMEATH: Riverdale, 11.ix.1938, AWS; WEXFORD: Oaklands Wood (S7125), 18.vi.1982, JMOC, mixed woods; WICKLOW: Coolattin Wood (T0-6-), 14.ix.1984, JPOC, Quercus; Glen of the Downs (O2611), 22.viii.1988, JPOC, mixed woods; Glencree, 30.vi.1940, AWS.

*B. bifoveata (Kieffer)
Widespread in Britain and almost certainly the male of B. parva Thomson (Nixon).
DOWN: Donard Lodge, 21.x.1958, AWS; DUBLIN: Gollierstown, 25.vii.1945, AWS; Castleknock (O089377), Malaise trap ix.1984, JMOC, suburban garden; Royal Canal, Luttrellstown (O0337), 28.ix.1986, JMOC, canal-side vegetation; WEXFORD: Killurin, 26.vii.1937, AWS.

B. ciliata (Kieffer)
Recorded from England, Germany, Ireland and Scotland (Nixon).
CAVAN: Virginia (N586882), 30.v.1982, JPOC, alder marsh;
DUBLIN: Merrion Square, 25.vi.1945, AWS; The Slade of Saggart, 24.v.1939, AWS.

*B. collaris Kieffer
Recorded from England (Nixon). The species was described from Scotland (Kieffer).
DOWN: Donard Lodge, 3.ix.1964, AWS; DUBLIN: The Slade of Saggart, 12.viii.1936, AWS; Royal Canal, Luttrellstown (O0337), 28.ix.1986, JMOC, canal-side vegetation; WESTMEATH: Riverdale, 11.ix.1938, AWS.

*B. crassiceps (Kieffer)
Recorded from England, Germany and Scotland (Nixon).
DUBLIN: Glenasmole, 16.vii.1941, AWS.

B. euterpe Nixon
Recorded from England and Ireland. According to Nixon, perhaps the male of B. semele Nixon.
SLIGO: Trawallua, 24-29.vii.1933, GEJN (BMNH).

*B. exigua (Marshall)
Recorded from England. According to Nixon, probably a fully winged form of B. parva Thomson.
CORK: Glengarriff (V920565), 12.vii.1985, JMOC, Quercus.

*B. fumipennis Westwood
Scotland to South East England. Sweden and Switzerland (Nixon). Also Denmark, France, Finland, Germany and Moldavia (Kieffer, Hellén, Kozlov).
KILDARE: Louisa Bridge (N9936), 2.viii.1982, JMOC, marshy area;
WICKLOW: Athdown, 24.vii.1938, AWS; near Calary Lower (O2311),

22.viii.1988, JPOC, marshy area; Connary, 27.viii.1939, AWS.

*B. helicicola (Kieffer)
Widely distributed in Britain but not common (Nixon). Described from France (Kieffer).
DOWN: Tollymore Park, 30.vii.1961, AWS.

B. longipennis (Kieffer)
Recorded from England, Ireland and Scotland (Nixon). Also known from Moldavia and Russia (Moscow district) (Kozlov).
CARLOW: Cloughristick (S7069), 19.vi.1982, JMOC;
DUBLIN: Ballymaice, 12.viii.1945, AWS, 1100ft; Castleknock (O089377), Malaise trap ix.1984, JMOC, suburban garden;
KILDARE: Louisa Bridge (N9936), 2.viii.1982, JMOC, marshy area;
WEXFORD: Duncannon (S7308), Malaise trap vi.1982, JPOC, rough pasture; WICKLOW: Glen of the Downs (O2611), 22.viii.1988, JPOC, mixed woods.

B. parva Thomson
Commonest of the flightless species of Basalys in England. Also recorded from Germany, Ireland and Sweden (Nixon).
DUBLIN: Castleknock (O089377), Malaise trap ix.1984, JMOC, suburban garden; Glenasmole, 30.vii.1953, AWS; KERRY: Ardagh, Killarney, 27.viii.1929, EFB; SLIGO: Lough Gill, 15.x.1937, AWS; WICKLOW: Coolattin Wood (T0-6-), 14.ix.1984, JPOC; Glen of the Downs (O2611), 22.viii.1988, JPOC, Quercus; Woodend, 29.ix.1951, AWS.

*B. pedisequa (Kieffer)
Recorded from Austria, England, Germany and Sweden (Nixon).
DONEGAL: Ards, 17.vi.1955, AWS; WICKLOW: Glen of the Downs (O2611), 22.viii.1988, JPOC.

B. scotica (Kieffer)
Scotland to South East England. Also Germany, Ireland and Sweden (Nixon).
KILDARE: Rye Water, 12.vii.1942; SLIGO: Trawalua, 8.vii.1936; WICKLOW: Bellevue, 11.vii.1945. All AWS.

B. singularis Nixon
England and Ireland (Nixon).
DUBLIN: Furry Glen, 26.ix.1937, AWS, holotype (BMNH) (Nixon).

*B. tritoma Thomson
Recorded from England. Bred from Oscinella frit (L.) (Diptera) (Nixon). Also known from Czechoslovakia, Finland, Moldavia and Sweden (Hellén, Kozlov).
DUBLIN: Castleknock (O089377), Malaise trap 8.viii-8.ix.1984, JMOC, suburban garden.

B. tuberculatus (Kieffer)
Recorded from England and Ireland. In England, it is only known from a ♀ collected in Surrey in 1912 (Nixon). Kieffer described it from Croatia (Gospić). Kozlov mentions Hungary.
WICKLOW: Clara, 4.ix.1938; Connary, 27.viii.1939. All AWS.

CORYNOPRIA Haliday
Three species recorded from Britain with two from Ireland.

C. cincta Haliday
Generally distributed in Great Britain and Ireland. The species possibly hibernates (Nixon). Also known from Belgium, Czechoslovakia, Finland, Moldavia, Sweden and the Ukraine (Crimea) (Hellén, Kozlov).
DUBLIN: Castleknock (O089377), Malaise traps, 26.iv.-26.v.1985, 3-28.vi.1985, JMOC, suburban garden; Merrion Square, 5.x.1945, AWS; KERRY: Lake side, Killarney, i.1932, EFB, in moss; Bunror,

Killarney, iii.1935, EFB.

*C. solida Thomson
Recorded from Austria, England, Germany and Sweden (Nixon, Kozlov).
KERRY: Killarney, iii.1935, EFB, garden.

DIAPRIA Latreille
One species recorded from Britain with two known from Ireland.

D. conica (Fabricius)
Widely distributed and common in Great Britain. Also known from Austria, Finland, France, Italy, the Soviet Union (sensu lato), Sweden, Yugoslavia, North Africa and North America (Hellén, Kozlov, Nixon). Nixon mentions it as a parasite of Eristalis tenax (L.) (Diptera). It has also been reared from two pupae of Eristalis arbustorum (L.) (Diptera) from decaying potatoes at the Murrough, Co Wicklow (T305982) (Blackith and Blackith, 1989). DUBLIN: Clondalkin, 24.viii.1941, AWS; Dollymount, 3.vi.1934, EOM; Harold's Cross, 18.v.1936, AWS; Gollierstown, 25.vii.1945, AWS; KERRY: Killarney (V9391), 15.ix.1981, JPOC, vegetation beside lake, V9291, 15.ix.1981, JPOC, golf course area beside the Lower Lake; KILDARE: Grand Canal (N933263), 12.ix.1982, JMOC; Kilteel, 17.ix.1933, AWS; Royal Canal, 12.vii.1942, 7.vi.1953, AWS; SLIGO: Markree, 9.viii.1932, AWS; WEXFORD: Curracloe, 18.vii.1937, North Slob, AWS, (T1127), 12.vi.1982, JMOC, sand-dunes; The Raven (T110260), 4.vi.1986, JPOC, conifers on sand-dunes; Killoughrim Forest (S8941), 4.iv.1988, JMOC, Quercus; Tintern Abbey (S7910), 31.iv.1988, JPOC, mixed wood along small river; WICKLOW: Kilmacanoge (O2514), 15.viii.1982, JMOC, marsh and stream; The Murrough, 5.viii.1942, AWS.

D. nigricornis Thomson
Nixon records 4 ♀♀ from Ireland and 1♀ from Germany but mentions

no British material. Also known from Finland, Moldavia, Russia (the St. Petersburg (Leningrad) district) and Sweden (Hellén, Kozlov).
DONEGAL: Knader, 9.viii.1933, AWS.

ENTOMACIS Forster
Four species recorded from Britain with five known from Ireland.

E. bipunctata (Kieffer)
Recorded by Nixon from England, Germany, Ireland and Sweden. No details are given for Ireland. Kieffer records it from Russia ("Rußland (Charkow)").

*E. laertes Nixon
This species was only known from few specimens collected in England, Italy and Sweden (Nixon).
CAVAN: Virginia (N586882), 30.v.1982, JMOC, alder marsh.

E. penelope Nixon
Only known from a single Irish specimen (Nixon). Erroneously, he gives the county as Sligo.
DONEGAL: Bundoran, vii.1933, GEJN, ♀ holotype (BMNH).

*E. perplexa (Haliday)
It has been bred from Forcipomyia picea (Winnertz) (Diptera). Commonest species of Entomacis in Britain. Also recorded from Czechoslovakia, Finland, Italy, Moldavia, Russia (the Yaroslav district) and Sweden (Hellén, Kozlov, Nixon).
DUBLIN: Glenasmole, 13.iv.1949, AWS; The Slade of Saggart, 4.x.1936, AWS; KILDARE: Landenstown, 10.vii.1940, AWS; WICKLOW: Blackditch Wood (O309034), 20.iv.-5.v.1990, Malaise trap, RB.

E. platyptera (Haliday)
Recorded by Nixon from England, Ireland and Sweden. No details are

given concerning the Irish material. Also known from Russia (the Primorsk territory) (Kozlov).

IDIOTYPA Forster

Two species are listed by Fergusson (1978) as occurring in the British Isles. However Nixon only includes I. nigriceps Kieffer, describing it as widespread but evidently not common. In NMI, there is an Irish specimen of the omitted species (I. rufiventris (Thomson)) which was identified by Nixon. Evidently he had forgotten to include the record. The two species may be readily identified using the following key from Kieffer.

1. Thorax dark reddish-brown. Abdomen ♀ black.....nigriceps
2. Thorax black. Abdomen ♀ reddish-brown.....rufiventris

*I. rufiventris (Thomson)

Known from Czechoslovakia (doubtful), England, Finland, Moldavia, Scotland and Sweden (Hellén, Kieffer, Kozlov).

KILDARE: Oldtown House, 4.vi.1953, AWS.

LABOLIPS Haliday

One species recorded from the British Isles.

L. innupta Haliday

Czechoslovakia, England, Finland and Ireland (Hellén, Nixon). The original description is based on Irish material and the details concerning the type locality are given here in full:- "Found not uncommon, in autumn (but females only), in a field laid down in grass after a corn crop. The exact locality, a field adjoining the rere of the kitchen-garden of a country house called Clifden, in the townland of Knocknagoney, between Belfast and Holywood, and about a quarter of a mile from the main road between these towns, along a by-road leading up to Knocknagoney National School-house" (Haliday, 1857). Haliday lived in Clifden House. Nixon reported 2♀♀ from Sligo.

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PARAMESIUS Westwood
Four species recorded from Britain and Ireland.

P. brachypterus Thomson
Generally distributed. England, France, Ireland, Scotland and Sweden. It evidently hibernates (Nixon).
CLARE: near Ennis (R292796), 30.v.1984, JPOC, mixed wood mainly hazel (Corylus avellana L.); KERRY: Guitane, Killarney, x.1934, EFB; Muckross, Killarney, ix.1937, EFB; Ross, Killarney, 24.i.1929, EFB; Ardagh, iii.1935, 11.xii.1929, all EFB; Killarney, 1929, EFB; KILDARE: Royal Canal, 31.viii.1952, AWS; Kilkea Park, 5.ix.1937, AWS; WICKLOW: Bellevue, 11.vii.1945, AWS; Glenmalure, 29.v.1940, AWS, in garden; Glending, 5.x.1952, AWS.

P. crassicornis Thomson
Widely distributed but evidently not common. England and Ireland (Nixon). Also France, Moldavia, Russia (the Yaroslav district) and Sweden (Kieffer, Kozlov).
DONEGAL: Lough Eske, 12.viii.1938, AWS; DUBLIN: Glenasmole, 6.x.1938, 19.viii.1942, AWS; KILDARE: Landenstown, 16.ix.1949, AWS; Oldtown House, 4.vi.1953, AWS; MAYO: Old Head Wood, 31.viii.1941, AWS.

*P. elongatus Thomson
Commonest species in Britain (Nixon). Also northern and central Europe including Denmark, Finland, France, Italy, Moldavia, Norway, Russia (St. Petersburg (Leningrad) district (as P. inchoatus Kieffer); Moscow district (as P. subinermis Kieffer)) and Sweden (Hellén, Kieffer, Kozlov).
CAVAN: Virginia Woods (N5987), 15.v.1989, JPOC; CORK: Glengarriff (V920565), 12.vii.1985, JMOC, also (V907575), 6.vii.1985, JMOC; DOWN: Tully, Newcastle Drive, 11.vii.1964, AWS, garden; DUBLIN: Glenageary, 24.vii.1933, JNH; Castleknock (O089377), 8.viii.-8.ix.1984, JMOC, Malaise trap in suburban garden;

GALWAY: Cleggan (L6157), 20.vii.1982, JPOC; KILDARE: Castlemartin, 4.viii.1946, AWS; Landenstown, 11.viii.1946, AWS; Royal Canal, 11.vii.1943, AWS; MAYO: banks, Cartron, The Mullet, 4.ix.1933, EOM; SLIGO: Toberscanavan, 22.vii.1933, AWS; WEXFORD: Carnsore, 19.vii.1937, AWS; WICKLOW: Woodend, 27.ix.1949, AWS; Coan, Glen of Immal, 8.viii.1937, AWS; Murrough, 25.viii.1953, AWS.

*P. westwoodi Fergusson
Generally distributed and fairly common in Britain. It possibly hibernates (Nixon). It is also known from central and northern Europe including Finland (Hellén).
DONEGAL: Knader, 22.viii.1932, AWS; DUBLIN: Clondalkin, 9.viii.1942, AWS; Glenasmole, 30.vii.1942, AWS; Saggart, 16.ix.1942, AWS; Glenageary, 24.vii.1933, JNH; KERRY: Muckross, Killarney, 30.vii.1923, EFB; KILDARE: Rye Water, 3.viii.1941, AWS; Landenstown, 14.viii.1949, AWS; WICKLOW: The Murrough, 28.viii.1954, AWS: near Calary Lower (O2311), 22.viii.1988, JPOC; Russellstown Park (N9610), 16.viii.1981, JMOC.

PHAENOPRIA Ashmead
Three species are recorded from Britain with one known from Ireland.

*P. cameroni Kieffer
Widespread and common in Britain (Nixon). Also known from France (Kieffer).
CLARE: Balleighter (R346940), 29.v.1984, JMOC; DUBLIN: Castleknock (O089377), 26.iv.-26.v.1984, 8.viii.-8.ix.1984, ix.1984, JMOC; KILDARE: Royal Canal, 30.vii.1944, AWS; Glending, 17.ix.1955, AWS; TIPPERARY: near Ballina (R710725), 27.v.1984, JPOC, small wood; WESTMEATH: Pakenham Hall (N4469), 23.vii.1989, JPOC; WEXFORD: Nethertown (T1204), 4.vi.1984, JPOC; WICKLOW: Rathdrum, 8.vii.1927, AWS.

PLATYMISCHUS Westwood
One species known from Britain and Ireland.

*P. dilatatus Westwood
A coastal species and probably abundant where it occurs in Britain, frequenting rotting seaweed. It has been bred from Orygma luctuosum Meigen (Diptera) (Nixon). Also known from Czechoslovakia (Kozlov).
CORK: Snave, 17.vii.1935, AWS, in sea-weed; DUBLIN: Loughshinny, 11.ix.1929, EOM; Ireland's Eye, 31.vii.1932, EOM; KERRY: Dunkerron, 5.vii.1935, AWS, in sea-weed; Parknasilla, 3.v.1931, EFB, crawling on stone.

PSILUS Panzer
Seven species are recorded from Britain with six known from Ireland.

*P. caecutiens (Marshall)
In the British Isles, P. caecutiens was only known from two sites in Scotland according to Nixon but Kieffer also mentions Surrey, England. It has also been taken in Czechoslovakia (Nixon).
DUBLIN: Clondalkin, 9.viii.1942, AWS; KILDARE: Curragh, 4.viii.1946, AWS; Rye Water, 16.viii.1942, AWS; Royal Canal, 3.viii.1949, AWS; WICKLOW: Glen of the Downs (O2611), 22.viii.1988, JPOC.

*P. cornutus Panzer
Widely distributed in Britain and has bred possibly from Phaonia sp. (Diptera) (Nixon). It has also been recorded from northern and central Europe including Austria, Finland, Germany, Italy, Moldavia, Sweden and Switzerland (Hellén, Kieffer, Kozlov).
DONEGAL: Finner, 10.x.1937, AWS; DOWN: Newcastle District, 25.vi.1961, AWS, dunes; DUBLIN: St. Anne's, Clontarf, 26.vi.1943; KILDARE: Donadea Forest Park (N8332), 11.x.1985, JPOC; MEATH:

Mornington (O1575), 15.vi.1989, JPOC; WICKLOW: Lough Dan, 22.ix.1940, AWS; Glen of the Downs (O2611), 27.viii.1981, JPOC.

P. frontalis (Thomson)
In the British Isles, this species was only known from an Irish ♀ taken in Dublin. There is also a record from Czechoslovakia (Nixon).
SLIGO: Carrowgarry, 17.x.1940, AWS.

*P. fuscipennis (Curtis)
Widely distributed and often common in Britain (Nixon).
Also known from Czechoslovakia (as P. bispinosus (Kieffer)) (Kozlov).
DOWN: Donard Lodge, 14.x.1958, AWS; KERRY: lake side, Killarney, 22.viii.1930, EFB, also 26.ix.1928, EFB and 11.vii.1930, EFB; Ballast, Killarney, 7.vii.1928, EFB and 7.vii.1928, EFB; Kenmare Estate (V945905), Killarney, 8.ix.1981, JMOC; WEXFORD: Oaklands (S7125), 18.vi.1982, JMOC, mixed wood; WICKLOW: Clara, 4.ix.1938, AWS; Glending, 16.ix.1953, AWS; Glen of the Downs (O2611), 3.x.1986, JPOC; near Calary Lower (O2311), 22.viii.1988, JPOC, small marshy area.

P. parvulus (Kieffer)
England and Ireland (Nixon). Also known from Scotland (Kieffer).
DUBLIN: Glenasmole, 24.iii.1950, AWS; WICKLOW: Buckroney, 14.viii.1946, AWS.

P. submonilis (Kieffer)
Czechoslovakia, England and Ireland (Nixon). Also known from Austria and Italy (Kieffer, Kozlov).
DONEGAL: L. Eske, 12.viii.1938, AWS; DUBLIN: Glenasmole, 23.iii.1938, AWS; Lynch Park, 13.iv.1952, AWS.

SPILOMICRUS Westwood
Eleven species recorded from Britain with eight known from Ireland.

S. abnormis Marshall
Widely distributed in England and Ireland but evidently not common (Nixon).
DUBLIN: Castleknock (O089377), ix.1984, JMOC, Malaise trap in suburban garden; WICKLOW: Coan, 14.vii.1940, AWS; Ballinclea, 21.vii.1940, AWS.

S. annulicornis Kieffer
England, Ireland and Scotland. Widespread and common (Nixon). Also known from Finland (Hellén).
CLARE: Corkscrew Hill (M202028), 21.iv.1984, JMOC; Ballyeighter (R346940), 29.v.1984, JMOC; DUBLIN: St. Anne's, Clontarf, 20.iv.1939, EOM; Glenasmole, 13.iv.1949, AWS; KERRY: Killarney, Aghador, 8.iii.1927, EFB; KILDARE: Royal Canal, 22.iv.1951, AWS; LOUTH: Bellurgan, 30.iii.1946, AWS; OFFALY: Charleville Wood (N3122), Tullamore, 1987, MCDS, rot hole (containing damp wood debris) in trunk base of Fraxinus, hatched 28.iii.1987; WESTMEATH: Ballynafid Lake (N409608), 5.v.1987, JPOC; WEXFORD: Curracloe (T1127), 9.vi.1982, JPOC, old pasture/alder marsh; WICKLOW: Golden Hill, 2.v.1934, AWS; Powerscourt (O2012), 15.vi.1988, JPOC; Manor Kilbride, 28.iv.1955, AWS; Glending Wood, 9.x.1946, AWS.

S. compressus Thomson
Generally distributed in Britain. A ♂ has been recorded from Drumgodd, Co Wicklow, 10.x.1942 (Nixon). Also known from Russia (St. Petersburg (Leningrad) district) and Sweden (Kieffer, Kozlov).
DUBLIN: Killeen, 4.x.1949, AWS; WICKLOW: Tinnode, 12.x.1924, AWS.

S. flavipes Thomson
England, Germany and Ireland. The Irish material is from Sligo and Wicklow, collected in July and August (Nixon). Also known from Finland, Moldavia and Sweden (Hellén, Kozlov).

S. hemipterus Marshall
England. Ireland and Switzerland (Nixon). Also known from France and Scotland (Kieffer).
CLARE: near Formoyle (M161066), 22.v.1985, JMOC; DUBLIN: Bull Island (O2538), 9.v.1982, JMOC, alder marsh; Lucan, 11.v.1951, AWS; WICKLOW: Devil's Glen, 6.xi.1938, AWS; Killoughter, 22.v.1932, AWS.

*S. integer Thomson
Generally distributed in Britain (Nixon). Also known from France, Germany, Russia (the St. Petersburg (Leningrad) district) and Sweden (Kieffer, Kozlov).
DUBLIN: Glenasmole, 4.vi.1941, AWS; OFFALY: Charleville Wood, Tullamore (N3222), 28.iv.1987, JPOC; WICKLOW: Dunran, 23.v.1937, AWS.

S. rufitarsis Kieffer
England and Ireland. Evidently a rare species. A ♀ was taken in Dublin during March. No details are given concerning the other Irish material (4♂♂) (Nixon).

S. stigmaticalis Westwood
Hails et al. (1990) reared a ♂ from an agamic gall of Andricus quercuscalcis (Burgsdorf) (Cynipidae). In addition, a ♀ has been bred from a beetle pupa (Quedius or Philonthus) (Coleoptera). Widely distributed and evidently common in Britain (Nixon). Also recorded from Czechoslovakia, Denmark, Finland, Moldavia (as S. nigripes Thomson), Russia (the St. Petersburg (Leningrad) district (as S. nigripes) and Sweden (Hellén, Kozlov).

DUBLIN: St. Anne's, 22.viii.1937, EOM; Glenasmole, 23.iii.1938, 8.v.1940, AWS; Castleknock (O089377), 26.iv.-26.v.1984, JMOC, Malaise trap in suburban garden; GALWAY: National Park, Letterfrack (L720575), 22.vii.1982, JMOC; KERRY: Cloghane, 12.vi.1946, AWS; KILDARE: Landenstown, 4.viii.1939, 28.viii.1946, AWS; Kilkea Park, 13.viii.1939, AWS; WEXFORD: Ballyhighland (S882407), 14.vi.1982, JMOC; WICKLOW: Glen of Imaal, Leitrim, 14.vii.1940, AWS.

TRICHOPRIA Ashmead

Twenty six species recorded from Britain with thirteen known from Ireland.

*T. aequata (Thomson)

Widespread and often abundant in Britain (Nixon). Also recorded from Sweden (Kieffer).

CAVAN: Virginia Woods (N5987), 20.iii.1988, JMOC; CORK: Garnish Island, Bantry (V934548), 1.vii.1985, JPOC; DONEGAL: Knader, 27.viii.1932, AWS; DOWN: Murlough House, 19.ix.1964, AWS, dunes; DUBLIN: The Slade of Saggart, 12.viii.1936 and 9.xi.1938, AWS, (O033245), 1.ix.1981, JMOC; Skeagh House, 12.viii.1937, AWS; Malahide Castle (O2253), 6.x.1985, JMOC; Killiney Hill, 29.viii.1932, JNH; Clondalkin (O0630), Malaise trap 16-29.iii.1982 and 3-17.vii.1982, JMOC, suburban garden; Royal Canal, near Luttrellstown (O0337), 28.ix.1986, JMOC; Glenasmole, 13.vi.1938, 24.ix.1940 and 25.vi.1941, AWS; Castleknock (O089377), ix.1984, JMOC, Malaise trap in suburban garden; GALWAY: Letterfrack (L6857), 24.vii.1982, JMOC; KERRY: Ballast, Killarney, vii.1933, EFB; O'Sullivan's Cascade (V9188), Killarney, 27.viii.1987, JPOC; Kenmare Estate (V945905), Killarney, 8.ix.1981, JPOC; Looscaunagh L. (V883794), 9.ix.1981, JPOC; Derrycunihy, Killarney, vii.1933, EFB; Blue Pool (V9886), Killarney, 30.viii.1987, JPOC; KILDARE: Grand Canal (N933263), 12.ix.1982, JMOC; Louisa Bridge (N9936), 2.viii.1982, JMOC;

Castletown (N975345), 8.viii.1982, JMOC; Skerries Bog, 19.ix.1946, AWS; Landenstown, 7.viii.1941, AWS; LAOIS: Emo (N538052), 3.x.1982, JMOC; North of Emo Park, 15.viii.1937, AWS; LEITRIM: Tullaghan, 6.vii.1936, AWS: SLIGO: Ballysadare Bay, Sligo District, 10.viii.1938, AWS; WESTMEATH: Lough Derravaragh (N400660), 16.iii.1982, JPOC, on stone in leaf litter; WICKLOW: Athdown, 30.vii.1936, AWS; Glen of the Downs (O2611), 27.viii.1981, 3.x.1986 and 22.viii.1988, JMOC; Knocksink (O2117), 27.iii.1987, JMOC; Russborough (N9611), 16.iv.1982, JMOC; Coolattin (T0-6-), 14.ix.1984, JPOC.

T. atricornis Kieffer
Nixon gives records from England, Ireland and Scotland. CLARE: near Corker Pass (M308107), 23.v.1985, JMOC, green road in Burren. DUBLIN: Glenasmole, 22.5.1938, AWS; Clondalkin (O0630), 30.v.-6.vi.1982, JPOC, Malaise trap in suburban garden; MEATH: Moygaddy, 10.vii.1940, AWS; WEXFORD: Killoughrim Forest (S9041), 4.iv.1988, JMOC; Nethertown (T1204), 4.vi.1984, JPOC (brachypterous); WICKLOW: Blessington, 31.vii.1946, AWS (brachypterous).

*T. ciliaris Kieffer
Widespread and evidently common in Great Britain (Nixon). Also known from Czechoslovakia, Finland and Russia (the St. Petersburg (Leningrad) district (Hellén, Kozlov). DUBLIN: Castleknock (O089377), 8.viii.-8.ix.1984, JMOC, Malaise trap in suburban garden; Royal Canal, Luttrellstown (O0337), 28.ix.1986, JMOC; KERRY: Killarney, xi.1934, EFB, garden; KILDARE: Newbridge Fen (N7616), 9.vi.1984, JMOC; TYRONE: Moy, 29.iii.1983, MB; WICKLOW: Coolattin (T0-6-), 14.ix.1984, JPOC.

*T. clavatipes (Kieffer)
Recorded from England where it has been bred from Sargus iridatus (Scopoli) and Syritta pipiens (L.) (Diptera) (Nixon). It was

described from Scotland (Kieffer).
KERRY: Tomies Wood, Killarney (V9188), 15.ix.1981, JPOC;
WEXFORD: Ballyteige (S954046), 5.vi.1986, JMOC, sand-dunes;
WICKLOW: near Calary Lower (O2311), 22.viii.1988, JPOC, small marshy area; Lough Ouler, 22.viii.1937, AWS.

*T. crassifemur Nixon
Recorded from England, Sweden and Switzerland (Nixon).
CLARE: Fanore (M1308), 31.vii.1988, JPOC.

T. halterata (Kieffer)
This may be the ♂ of T. atricornis. Recorded from England and Ireland (Nixon). It was described from Scotland (Kieffer).
WICKLOW: near Calary Lower (O2311), 22.viii.1988, JPOC, small marshy area.

*T. inermis (Kieffer)
It has been bred from the puparia of Brachicoma devia (Fallén), Lucilia sericata (Meigen) and Mesembrina meridiana (L.) (Diptera). Recorded from England, France, Germany, Scotland, Sweden and Switzerland (Nixon).
DUBLIN: Castleknock (O089377), 8.viii.-8.ix.1984, JMOC, Malaise trap in suburban garden; KERRY: Bunroe, Killarney, ?viii.1935, EFB.

*T. longicornis (Thomson)
Recorded from England and Sweden (Kieffer, Nixon).
MAYO: Catron, The Mullet, 8.ix.1933, EOM.

T. nigricornis (Marshall)
Probably a common coastal species in the British Isles. Taken frequently by Stelfox under Silene vulgaris maritima (With.) Á. and D. Löve. A long series of ♂♂ was taken with ♀♀ from the coast of Sligo (Nixon). It was described from Sweden (Kieffer).

KERRY: Killarney, 17.vii.1928, EFB, fen; KILDARE: Kilkea Park, 13.viii.1939, AWS; WICKLOW: Buckroney, 8.vii.1946, AWS.

*T. nigripes (Thomson)
This may be the ♂ of T tenuicornis (Thomson). It is widespread and fairly common in Britain (Nixon). Also known from Sweden (Kieffer).
DUBLIN: Castleknock (O089377), 8.viii.-8.ix.1984, JMOC, Malaise trap in suburban garden; Royal Canal, Luttrellstown (O0337), 28.ix.1986, JMOC.

*T. sociabilis Masner
Recorded from England (Nixon).
KERRY: Ardagh, Killarney, x.1933, EFB.

*T. verticillata (Latreille)
Widely distributed and almost as common as T. aequata in Britain (Nixon). Also recorded from Austria, the Baltic region, Finland, France, Germany, Moldavia and Switzerland (Hellén, Kozlov).
DUBLIN: Castleknock (O089377), 26.iv.-26.v.1984, 8.viii.-8.ix.1984, JMOC; Furry Glen, 20.viii.1936, AWS; Killiney Hill, 29.viii.1932, JNH; Merrion Square, 5.x.1945, AWS; KERRY: Ardagh, Killarney, iii.1935, EFB; Ballast, Killarney, vii.1933, EFB; Kenmare Estate, Killarney (V945905), 8.ix.1981, JPOC; Killarney, 1929, EFB; Rosbeigh, iii.1929, EFB; KILKENNY: Kilkenny, 30.iv.1936, AWS; WEXFORD: Curracloe (Ruincott), 27.vii.1937, AWS; WICKLOW: Bellevue, 30.viii.1933, AWS; Glen of the Downs (O2611), 22.viii.1988, JPOC; Powerscourt Deerpark, 10.viii.1940, AWS; The Murrough, 21.viii.1938, AWS.

T. wasmanni (Kieffer)
Recorded from England, Germany, Ireland and Sweden. The Irish records are based on an unlocalised ♂ and a Sligo ♀ (Nixon). Also known from Austria (Kieffer).

CORK: Glengarriff (V9057), 7.vii.1985, JPOC; DUBLIN: The Slade of Saggart, 26.v.1936, AWS; Royal Canal, Luttrellstown (O0337), 28.ix.1986, JMOC; Castleknock (O089377), 26.iv.-26.v.1985, ix.1986, JMOC, Malaise trap in suburban garden; KERRY: Killarney, 4.xii.1928, EFB; Kenmare Estate (V9490), Killarney, 8.ix.1981, JPOC; KILDARE: Bryanstown, 4.viii.1937, AWS; Grand Canal (N933263), 12.ix.1982, JMOC; WEXFORD: Nethertown (T1204), 4.vi.1984, JMOC; WICKLOW: Glen of the Downs (O2611), 3.x.1986, JMOC.

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THE FRESHWATER OSTRACODA OF IRELAND

Dermot J. Douglas and Gillian McCall

The Ostracoda are small, bivalved crustaceans which may be found living in all types of aquatic habitats - fresh water, brackish and marine. In size they average 1mm but freshwater species are known to range in length from 0.35mm to about 7mm - although the largest Irish specimen so far recorded is only 2.7mm long. Four extant orders of the sub-class Ostracoda are recognized, but only one of these - the Podocopida - contains freshwater representatives.

Ostracods have been largely neglected in Ireland since the turn of the century. Indeed, the comment of Canon Norman in 1905 still remains true - "The great extent of fresh water in Ireland ought to make that country very rich in species of Entomostraca which are not marine; but very little has been done among the freshwater forms, although that little has brought to light species which have hitherto escaped detection elsewhere in the British Isles. It may be hoped that the publication of this list will induce some young naturalists in Ireland to take up this interesting study". Unfortunately this hope of Norman's was not realized and the only significant increase in the published number of species in Ireland came with the work of McCall (1975, 1976, 1983).

Although some 400 species of ostracod have been recorded from freshwater environments in Europe, there are, at present, only 18 species representing 12 genera listed as occurring in Ireland in Limnofauna Europaea (Löffler and Danielopol, 1978). This list is incomplete as it does not include many species whose occurrence has been recorded in Irish journals.

The small size and taxonomic problems associated with the group

have led to its almost total neglect by Irish limnologists. The lack of indigenous expertise meant that confidence in identification was limited, with the result that specimens tended to be lumped together under the catch-all title of "ostracods". Standard limnological collecting techniques are too crude to retain any but the largest specimens. In order to sample adequately, special techniques must be used and nets with meshes ranging from 60μm to 200μm must be employed. Sampling must be geared to the type of freshwater habitat being sampled - e.g., lake, pond, river, stream, groundwater, ditches, cattle troughs and tractor ruts. There is a definite seasonality in the abundance of some ostracods and this must be taken into account when sampling.

It is possible to identify a number of ostracods from the architecture of their valves alone, so it is useful to obtain these from deposits along with living specimens. Valves washed into the deltaic regions of rivers can provide considerable information on the ostracod communities of that river. Indeed ostracod valves taken from lake sediments can provide palaeolimnological information on the past lake ecology and lake development. However, the techniques normally employed to process sediment for other microfossils are too harsh for ostracod valves. Sediment samples are best treated with a dilute solution of hydrogen peroxide to disperse the clay fraction of the sediment. Valves can then be picked out individually.

Generally, the largest freshwater ostracods occur in standing waters while the smallest are found in running water. Groundwater species tend to be intermediate in size between lotic and lentic forms.

In order to identify ostracods properly it is necessary to kill them for dissection. Animals are best killed in concentrated

formalin. The specimens and some of the water in which they are contained are added to the formalin. Formalin should not, however, be used as a preservative as it decalcifies the valves making identification impossible. After killing, specimens should be transferred to 90% alcohol. The valves should be examined, measured and their colour noted before dissection.

For identifying ostracods, the most useful publications have been Sars (1928), Klie (1938) and van Markhoven (1962/1963). Many new species, particularly of the Candonidae, have been described in the last 50 years which are not included in these works. It has been necessary therefore, to consult individual papers to be sure of identification. Particularly useful in this regard is the paper of Absolon (1978) on the Candonidae. No Irish work would have been done at all in the 1960's and 1970's without Michael Hounsome's unpublished key to the British freshwater Ostracoda. The publication of a synopsis of the British freshwater Ostracoda by P. A. Henderson (1990) should stimulate new workers in the field; we have not yet tested this key. The earliest records of Irish ostracods are contained in Brady (1868) and Brady and Norman (1889). Scharff (1897) compiled a list of Irish ostracods from the monograph by Brady and Norman (1889). Norman (1905) updated the list and recorded 36 freshwater species representing 19 genera. In their review of the European freshwater ostracods, Löffler and Danielopol (1978) did not include this paper, with the result that many published records for Ireland were not catalogued. Some ostracod records have been published in general works on the Crustacea. Post 1905 records of the Irish freshwater Ostracoda are to be found in the publications of Kane (1907), Brady (1910), Scourfield (1904, 1912), Gurney (1921), Southern and Gardiner (1926), Graham and Logan (1970), Partridge and Foy (1972), Fahy (1974), McCall (1975, 1976, 1983) and Douglas and Healy (1991). In addition, Hayward circulated but did not publish a 1969 report on an expedition to the Mullet Peninsula, Co. Mayo which included

records of eight ostracod species. The most recent account of the distribution of Irish ostracod species is given by Henderson (op. cit.). He records the locations of some 23 species, 13 less than was recorded by Norman in 1905. It is difficult to be sure of the source of Henderson's records as his reference list includes only three papers relevant to Ireland viz. Brady (1910), Brady and Robertson (1870) and Scourfield (1904). Some of his locations cannot be traced to these publications and must, therefore, be from another uncited source. Because of the small scale of the distribution maps presented by Henderson it is only possible to establish the county from which the specimen was found. As some of these records are undoubtedly new, all of Henderson's locations are cited in the text.

The purpose of this paper is to review our knowledge of the Irish freshwater ostracod fauna and to bring the Irish list up to date. Details of the location for most species are given in the original source record so they are not repeated here. However the locations are given for new records and for species which have been added to the Irish list by the authors. We have opted to provide a comprehensive list of citations (even though some are simply repetitions of earlier published data). Classification in the list follows Limnofauna Europaea (1978) but where a species was first recorded by a synonym this is indicated in the list.

All the new material from Co. Carlow and Co. Tipperary was collected and identified by Gillian McCall. New material from Co. Meath, Co. Louth and Co. Dublin (unless otherwise stated in the text) was collected and identified by Dermot Douglas.

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List if Irish freshwater Ostracoda

Candona angulata G. W. Müller
Brady, 1910; Scourfield, 1912; Henderson, 1990 (Antrim).

Candona candida (O. F. Müller)
Brady and Norman, 1889; Norman, 1905; Brady, 1910; Scourfield, 1904, 1912 (as C. lactea Baird); Gurney, 1921; Hayward, 1969; McCall, 1976, 1983; Löffler and Danielopol, 1978; Douglas and Healy, 1991.
CARLOW: Rathrush, S8369, 1.xi.1983; Kilcarrig, S7261, 16.vi.1984; Bilboa, S6571, 4.ix.1984; Ballyellin, S6955, 18.ix.1984; Gowlin, S7743, 25.ix.1984; Rossdillig, S7851, 25.ix.1984; Lorum, S7256, 26.ix.1984; Ullard, S8362, 8.x.1984; Altamont lake, S8665, 8.x.1984; Lisnavagh, S8778, 10.x.1984; Lisnavagh, S8880, 10.x.1984; Milford, S7070, 14.x.1984.
LOUTH: Windy gap, J1313, March and April each year from 1984 to 1991.
MEATH: L. Brackan, N8788, May - every year from 1984 to 1991.
Note: Brady and Norman (1889) recorded C. lactea Baird from L. Neagh and Co. Monaghan. Scourfield (1904, 1912) recorded its occurrence in Ireland in his synopsis of the British freshwater Entomostraca; this is probably based on the same records as Brady and Norman. The status of this species is regarded as doubtful by Löffler and Danielopol (1978), and Absolon (1978) regards it as a juvenile stage of C. candida O. F. Müller.

Candona fragilis Hartwig
Brady, 1910; Scourfield, 1912.

Candona neglecta Sars
Brady, 1910; Löffler and Danielopol, 1978, unconfirmed; Douglas and Healy, 1991.
CARLOW: Ballynasilloge, S7552, 25.ix.1984; Rossdillig, S7851,

25.ix.1984; Cloghristick, S7069, 14.x.1984.
MEATH: L. Brackan, N8788, 21.v.1988.

Candona stagnalis Sars
Kane, 1907; Scourfield, 1912.

Candona compressa (Koch)
Brady, 1868; Norman, 1905; Scourfield, 1904, 1912; Henderson, 1990 (Dublin).
ANTRIM: Glengormley, 1968, M. V. Hounsome, pers. comm. (No details of the exact location are available).

Candona albicana (Brady) 'syn. C. parallela G. W. Müller'
Henderson, 1990 (Wicklow).

Candona insculpta G. W. Müller
Brady and Norman, 1889, as Candona pubescens (Koch).

Candona fabaeformis Fischer
Brady and Norman, 1889; Norman, 1905; Scourfield, 1904, 1912; Douglas and Healy, 1991.
CARLOW: Cole's bog, S8370, 26.v.1984; Clorusk, S6761, 18.ix.1984; Lisnavagh, S8880, 10.x.1984.

Candona caudata Kaufmann
Brady and Norman, 1889; Brady, 1910; Norman, 1905, as C. elongata Brady and Norman; Scourfield, 1904, 1912; Löffler and Danielopol, 1978; Henderson, 1990 (Antrim).

Cryptocandona reducta Alm
McCall, 1975, 1976.

Cryptocandona vavrai (Kaufmann)
McCall, 1975, 1976; Douglas and Healy, 1991.

CARLOW: Cole's bog, S8370, 26.v.1984; Bilboa, S6571, 4.ix.1984.

Nannocandona sp. (close to faba)
Douglas and Healy, 1991.
Note: Two species viz. N. faba Ekman and N. stygia Sywula have been described for this genus. The size ranges for these species are 410-450µm and 520-550µm respectively. The specimens obtained by Douglas had a maximum size of 370µm. The presence of mature ovocytes in the female confirms that these specimens are adult - making this species the smallest Holarctic candonid. This was the first record of the genus in Ireland or Britain.

Candonopsis kingsleii (Brady and Robertson)
Brady and Norman, 1889; Norman, 1905; Scourfield, 1904, 1912.

Paracandona euplectella (Brady and Norman)
Douglas and Healy, 1991.
ANTRIM: Glengormley, 1968, M. V. Hounsome, pers. comm.

Cyclocypris globosa (Sars)
Norman, 1905; Scourfield, 1904, 1912; McCall, 1976; Henderson, 1990 (Galway).

Cyclocypris laevis (O. F. Müller)
Brady and Norman, 1889; Norman, 1905; Scourfield, 1904, 1912; Kane, 1907; Löffler and Danielopol, 1978; Henderson, 1990 (Galway).

Cyclocypris ovum (Jurine)
Hayward, 1969; McCall, 1983; Douglas and Healy, 1991.
ANTRIM: Glengormley, 1968, M. V. Hounsome, pers. comm.
CARLOW: Oakpark, S7379, 12.viii.1983; Ballyvolden, S8369, 1.xi.1983; Aghade, S8469, 1.xi.1983; Mulhall's pond, Roscat, S8371, 29.iii.1984; Glounmore, S8370, 26.v.1984; Cole's bog and

Ardristan, S8370, 26.v.1984; Fighting Cocks, S7768, 17.vi.1984; Bilboa, S6571, 4.ix.1984; Clorusk, S6761, 18.ix.1984; Fenniscourt, S6959, 18.ix.1984; Knocklishen beg, S9181, 7.x.1984; Ballykealy, S8267, 8.x.1984; Altamont lake, S8665, 8.x.1984; Lisnavagh, S8880, 10.x.1984; Donnelly's pond, Roscat, S8271, 12.x.1984; Oakpark, S7380, 12.x.1984; Seven Springs, S8171, 12.x.1984; New Garden, S7180, 30.iv.1985.
MAYO: Termoncarragh lake, 1969, M. V. Hounsome, pers. comm.
NORTH TIPPERARY: Bouladuff, S0563, 17.vii.1986; Tinvoher, S1067, 24.vii.1986; Barnana, S0671, 24.vii.1986; Fairyhill, S0672, 24.vii.1986.

Cyclocypris serena (Koch)
Brady and Norman, 1889; Norman, 1905; Scourfield, 1904, 1912; Henderson, 1990 (Galway).
Note: the record of C. serena in Co. Laois in McCall (1983) is doubtful; it is more likely to have been C. ovum.

Cypria exsculpta (Fischer)
Brady, 1868, 1910 as Cypris striolata Brady; Brady and Norman, 1889; Norman, 1905; Kane, 1907; Scourfield, 1904, 1912; Henderson, 1990 (Galway).
NORTH TIPPERARY: Bouladuff, S0563, 17.vii.1986.

Cypria ophthalmica (Jurine)
Brady and Norman, 1889; Norman, 1905; Scourfield, 1904, 1912; Southern and Gardiner, 1926; Hayward, 1969; Partridge and Foy, 1972; Löffler and Danielopol, 1978; McCall, 1976, 1983; Douglas and Healy, 1991.
CARLOW: Oakpark, S7379, 12.viii.1983; Carlow, S7478, 12.viii.1983; Rathrush, S8369, 1.xi.1983; Ardristan, S8370, 1.xi.1983; Mulhall's pond, Roscat, S8371, 29.iii.1984; Big Stone, S8484, 27.v.1984; Bilboa, S6571, 4.ix.1984; Clorusk, S6761, 18.ix.1984; Goresbridge, S6854, 18.ix.1984; Fenniscourt, S6859, 18.ix.1984; Ballyellin,

S6955, 18.ix.1984; Ballynasilloge, S7552, 25.ix.1984; Rossdillig, S7851, 25.ix.1984; Williamstown, S9079, 7.x.1984; Knocklishen beg, S9181, 7.x.1984; Ballykealy, S8267, 8.x.1984; Murphy's pond, Roscat, S8271, 10.x.1984; Lisnavagh, S8880, 10.x.1984; Oakpark, S7380, 12.x.1984; Seven Springs, S8171, 12.x.1984; Milford, S7070, 14.x.1984; Johnstown, S7776, 14.x.1984; Kellistown, S7971, 14.x.1984; New Garden, S7180, 30.iv.1985.
NORTH TIPPERARY: Bouladuff, S0563, 17.vii.1986; Fishmoyne, S0467, 26.vii.1986.

Ilyocypris bradyi Sars
Norman, 1905; Scourfield, 1912; Henderson, 1990 (Clare).

Ilyocypris gibba (Ramdohr)
Henderson, 1990 (Antrim).

Ilyocypris biplicata (Koch)
ANTRIM: Glengormley, 1968, M. V. Hounsome, pers. comm.
MAYO: Inishkea, 12.xii.1976, collected by A. B.West, determined by McCall.
Note: Klie (1938) pointed out that, while Sars (1928) thought I. gibba and I. biplicata to be separate species, he considered biplicata to be a sub-species of I. gibba (Ramdohr). However he qualified this opinion by stating that more work needed to be done. Tressler (1969) distinguished between the two species on the basis of the valve. Both I. gibba and I. biplicata are known from Great Britain and Europe and are included in Limnofauna Europaea. Henderson (pers. comm.) agrees with Klie and considers the two species to be the same and attributes differences in the valves to environmental conditions. In the absence of unambiguous evidence, we have decided to include both types as separate species.

Notodromas monacha (O. F. Müller)
Brady and Norman, 1889; Norman, 1905; Scourfield, 1904, 1912;

McCall, 1983, Henderson, 1990 (Mayo).
CARLOW: Carlow, S7478, 12.viii.1983; Clorusk, S6761, 18.ix.1984; Johnstown, S7676, 14.x.1984.

Cypris bispinosa Lucas
Brady and Norman, 1889; Norman, 1905; Scourfield, 1904, 1912; Löffler and Danielopol, 1978; Henderson, 1990 (Kerry).

Cypris pubera O. F. Müller
Brady and Norman, 1889; Norman, 1905; Scourfield, 1904, 1912; Graham and Logan, 1970.

Eucypris lutaria (Koch)
CARLOW: Doyle's pond, Lough Martin, S8372, 29.iii.1984.
The "pond" had been drained and the field ploughed. The specimen was recovered from flooded ruts.

Eucypris pigra (Fischer)
Norman, 1905, Scourfield, 1904, 1912 - recorded as Herpetocypris tumefacta (Brady and Robertson).

Eucypris virens (Jurine)
Norman, 1905; Scourfield, 1904, 1912; McCall, 1983.
CARLOW: Mulhall's pond, Roscat, S8371, 29.iii.1984; Doyle's pond, L. Martin, S8372, 29.iii.1984; Carrigleade, S7241, 25.ix.1984.

Cypricercus fuscatus (Jurine)
Brady and Norman, 1889; Norman, 1905; Scourfield, 1904, 1912.

Cypricercus obliquus (Brady)
Scourfield, 1904, 1912 as Cypris obliqua Brady.

Cypricercus affinis (Fischer)
Brady and Norman, 1889 - recorded as Cypris reticulata Zaddach;

Norman, 1905.
CARLOW: Cole's bog, S8370, 26.v.1984; Milford, S7070, 30.iv.1985.

Heterocypris incongruens (Ramdohr)
Brady, 1868; Brady and Norman, 1889; Norman, 1905; Scourfield, 1904, 1912; Löffler and Danielopol, 1978; McCall, 1976, 1983; Henderson, 1990 (Antrim, Down, Mayo - 2 sites -, Cork).
ANTRIM: Glengormley, 1968, M. V. Hounsome, pers. comm.
CARLOW: Clorusk, S6861, 18.ix.1984; Laurel Lodge, S8377, 7.x.1984.
DOWN: Co. Down, 1968, M. V. Hounsome, pers. comm.
KERRY: Blasket Is., 1964, M. V. Hounsome, pers. comm.

Heterocypris salina (Brady)
Brady and Norman, 1889, as Cypris prasina Fischer; Norman, 1905, as Cyprinotus prasinus (Fischer); Scourfield, 1904, 1912, as Cyprinotus prasinus (Fischer); Henderson, 1990 (Mayo).
MAYO: Termoncarragh Lake, 1969, M. V. Hounsome, pers. comm.
DUBLIN: Booterstown marsh (ditch), O2030, 1988.
Note: H. salina was mistakenly recorded as H. incongruens in Hayward (1969).

Herpetocypris chevreuxi (Sars)
Fahy, 1974.
CARLOW: Fenniscourt, S6859, 18.ix.1984.

Herpetocypris reptans (Baird)
Brady and Norman, 1889; Norman, 1905; Kane, 1907; Scourfield, 1904, 1912; Graham and Logan, 1970; McCall, 1983; Henderson, 1990 (Antrim).
CARLOW: Oakpark, S7379, 12.viii.1983; Bilboa, S6571, 4.ix.1984; Aghabeg, S7557, 26.ix.1984; Lisnavagh, S8778, 10.x.1984; Cloughristick, S7069, 14.x.1984.
LOUTH: Windy Gap, J1313, 21.iii.1987; River Dee, N9791, 14.x.1991.
MEATH: L. Brackan, N8788, 22.iv.1988.

Psychodromus olivaceus (Brady and Norman)
Norman, 1905; Scourfield, 1912; Hayward, 1969.

Psychodromus robertsoni (Brady and Norman)
Brady, 1910; Scourfield, 1912; Henderson, 1990 (Donegal). All three of the citations are probably the original record of Brady (1910).
Note: other than this record the species is known only from Great Britain. Löffler and Danielopol (1978) are doubtful about its status.

Scottia pseudobrowniana Kempf
The only previous record of this species in Ireland is that of Preece and Robinson (1982) who recorded it as a sub-fossil from post-glacial deposits.
DUBLIN: Sandyford, 1973, collected by D. Goodhue, determined by McCall.

Cypridopsis aculeata (Costa)
Brady and Norman, 1889; Norman, 1905; Scourfield, 1904, 1912, as Cypridopsella aculeata (Costa); Hayward, 1969; Löffler and Danielopol, 1978 (misprinted as "aculeta"); Henderson, 1990 (Antrim).

Cypridopsis helvetica Kaufmann
CARLOW: Gowlin, S7743, 25.ix.1984. Collected from a water trough for cattle.

Cypridopsis newtoni Brady and Robertson
Brady and Norman, 1889; Norman, 1905.
CARLOW: Rossdillig, S7851, 25.ix.1984.

Cypridopsis obesa Brady and Robertson
Norman, 1905, as Pionocypris obesa Brady and Robertson;

Scourfield, 1904, 1912; Henderson, 1990 (Galway).

Cypridopsis picta (Strauss)
Kane, 1907; Scourfield, 1912.
This species is known as Pionocypris picta (Strauss) in Sars (1928). It is not mentioned by Klie (1938). The status of the species is uncertain (Löffler and Danielopol, 1978). Henderson does not mention this species in his British list.

Cypridopsis vidua O. F. Müller
Brady and Norman, 1889; Norman, 1905, as Pionocypris vidua (O. F. Müller); Scourfield, 1904, 1912; Fahy, 1974; Löffler and Danielopol, 1978; McCall, 1983; Henderson, 1990 (Dublin).
CARLOW: Oakpark lake, S7379, 12.viii.1983; Seskin Lower, S6767, 18.ix.1984; Royal Oak, S6861, 18.ix.1984; Milltown, S7858, 26.ix.1984; Altamont lake, S8665, 8.x.1984; Altamont pond, S8666, 8.x.1984; Kilcarry, S8962, 8.x.1984; Oakpark, S7380, 12.x.1984; Cloghristick, S7069, 14.x.1984; Milford Mill, S7070, 14.x.1984.
NORTH TIPPERARY: Templemore, S1071, 24.vii.1986; Knocka, S0868, 26.vii.1986.

Potamocypris fulva (Brady)
Brady and Norman, 1889; Norman, 1905; Scourfield, 1904, 1912; Löffler and Danielopol, 1978.

Potamocypris variegata (Brady and Norman)
Brady and Norman, 1889 and Norman, 1905, as Cypridopsis variegata Brady and Norman; Scourfield, 1904, 1912, as Cypridopsella variegata (Brady and Norman); Löffler and Danielopol, 1978.

Potamocypris villosa (Jurine)
Brady and Norman, 1889, and Norman, 1905 as Cypridopsis villosa (Jurine); Scourfield, 1904, 1912, as Cypridopsella villosa (Jurine); McCall, 1983.

CARLOW: Wells, S6860, 24.vi.1983; Oakpark, S7379, 12.viii.1983; Cole's bog, S8370, 26.v.1984; Gowlin, S7743, 25.ix.1984; Lisnavagh, S8778, 10.x.1984.

Darwinula stevensoni (Brady and Robertson)
Brady and Norman, 1889; Norman, 1905; Scourfield, 1904, 1912; Graham and Logan, 1970; McCall, 1983.
CARLOW: Oakpark, S7379, 12.viii.1983.
MAYO: Termoncarragh lake, 1969, M. V. Hounsome, pers. comm.
NORTH TIPPERARY: Bouladuff, S0563, 17.vii.1986.

Limnocythere compressa Brady and Norman
Hayward, 1969.
Note: Löffler and Danielopol (1978) cast doubt on the validity of this species; indeed, the only published record of it in Europe is from lowland Scotland (Scourfield, 1904). It is most likely that L. compressa is actually L. inopinata var compressa, which is figured Plate XVII and figs 18 and 19 in Brady and Norman (1889), and not a separate species. There is no mention of L. compressa in Klie. Henderson (op. cit.) thinks that this species is probably referable to Limnocythere relicta Lilljeborg.

Limnocythere inopinata (Baird)
Norman, 1905; Kane, 1907; Scourfield, 1912; McCall, 1983.
CARLOW: Oakpark, S7379, 12.viii.1983.

Limnocythere sancti-patricii Brady and Robertson
Brady and Norman, 1889; Norman, 1905; Scourfield, 1904, 1912; Löffler and Danielopol, 1978.

Cytherissa lacustris (Sars)
Brady and Norman, 1889; Norman, 1905; Scourfield, 1904, 1912, all as Cytheridea lacustris (Sars); Löffler and Danielopol, 1978; Henderson, 1990 (Antrim).

Leptocythere castanea (Sars)
Norman, 1905, as Cythere pellucida Baird; Löffler and Danielopol, 1978.
Note: it appears from Norman's description that this is a predominantly marine species. However, Sars (1928) indicated its presence in brackish water as did Klie (1938).

Metacypris cordata Brady and Robertson
Brady and Norman, 1889; Norman, 1905; Scourfield, 1904, 1912.

Cyprideis torosa littoralis (Jones)
Norman, 1905, and Scourfield, 1904, 1912, as Cytheridea torosa (Jones); Löffler and Danielopol, 1978.
MAYO: Termoncarragh lake, 1969, M. V. Hounsome, pers. comm.

Loxoconcha elliptica Brady
Norman, 1905, as L. impressa (Baird); Löffler and Danielopol, 1978.

Loxoconcha pusilla Brady and Robertson
Norman, 1905; Löffler and Danielopol, 1978.
Note: Klie (1938) regarded Loxoconcha as a marine genus. Sars (1928) regarded it as a littoral/marine form and the records of its occurrence in Ireland are all coastal, although its appearance between tide-marks suggest that it may tolerate brackish conditions.

Discussion

The present revision of the list of Irish genera and species together with the addition of records from work undertaken since 1905 has given us a total of 59 species representing 25 genera. Four of these species viz. Leptocythere castanea, Cyprideis litoralis, Loxoconcha elliptica and L. pusilla are considered to

be brackish and have been omitted by Henderson from his British list. However, all four species are included in Limnofauna Europaea. If these species, which have also been recorded in Great Britain, are added to Henderson's list then a total of 89 species representing 29 genera are on record for Great Britain.

Three species, recorded from Ireland, are not known from Great Britain. These are Cypridopsis helvetica, C. picta and Nannocythere sp. (c.f. faba). However, the status of C. picta is uncertain. Scottia pseudobrowniana was previously known from sub-fossil material in Co. Offaly (Preece and Robinson, 1982). Indeed a number of extant species were recovered from the same material, i.e., tufaceous deposits 3,000 to 8,000 years b.p. Seven of the ten recorded species are known from modern Irish material. There is no reason why the other three species, which are well known in recent times from Europe, should not occur in similar ecological niches in Ireland today. These species are Potamocypris wolfi Brehm, Potamocypris maculata Alm and Herpetocypris brevicaudata Kaufm. The presence of P. wolfi in Co. Carlow is suspected but awaits confirmation. A description of the ecological aspects of the sites in Co. Carlow is in preparation (McCall) and will be published separately.

One genus, Scottia, and three species, Eucypris lutaria, S. pseudobrowniana, and C. helvetica are recorded from Irish freshwater habitats for the first time.

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NEW RECORDS OF WEEVILS (COLEOPTERA: CURCULIONIDAE) FROM VARIOUS IRISH VICE-COUNTIES

M. G. Morris and J. P. O'Connor

Weevils collected from various parts of Ireland by J. P. O'Connor and M. A. O'Connor during the 1980s were determined recently by MGM. The collection contains some interesting species and some of the species constitute new vice-county records. These are detailed below. Names follow Kloet and Hincks (1977).

Otiorhynchus auropunctatus Gyllenhal.
This well-known 'Lusitanian' species is known from only one specimen in Great Britain (Morris, 1972), but is often abundant within its limited range in Ireland. It is known from vice-counties Wicklow, Dublin, Meath, Louth, East Donegal and Derry. To these must now be added Co. Kildare (19): one specimen was taken at Donadee (N8332) on 11 September 1985. This record is of particular interest as all others have been from maritime counties.

Phyllobius argentatus (L.)
This generally common species seems to be less well recorded in Ireland than in Great Britain. There appears to be no previous record from Co. Wexford (12), where a specimen was taken at Oaklands (S7125) on 18 June 1982.

Phyllobius pomaceus Gyllenhal
A specimen taken at Virginia (N593877), Co. Cavan (30), on 30 May 1982 has red legs in place of the usual dark brown or black ones, but the short antennae and uniform covering of green scales show it to be this species rather than P. calcaratus (F.), which is widely distributed in Ireland. Remarkably, P. pomaceus, which is common throughout England, Wales and Scotland, has been recorded

previously only from Killarney, Co. Kerry (Bullock, 1914; O'Mahony, 1929). It is a large and conspicuous species which is unlikely to be easily overlooked. Most 'short-nosed' weevils are polyphagous, but P. pomaceus is generally associated with Urtica dioica L. and also occurs on Filipendula vulgaris Moench. Its occurrence in two such widely-separated counties as Kerry and Cavan, and its great rarity in Ireland, are both remarkable.

Polydrusus undatus (F.)
This species is quite widely distributed in Ireland (and the British Isles generally) but not very common. A specimen collected at Glengarriff (V920565), West Cork (3), constitutes a new county and vice-county record.

Barynotus obscurus (F.)
Widely distributed throughout Ireland and Great Britain, this species has not been recorded previously from North Tipperary (10). A singleton was taken at Ballina (R708727) on 4 July 1981.

Sitona regensteinensis (Herbst)
This generally common and abundant species of Ulex and Cytisus spp. was previously unrecorded from Co. Offaly (18), where a specimen was taken at Clara Bog (N265295) on 30 April 1984.

Hypera nigrirostris (F.)
An example of this common species, associated particularly with Trifolium pratense L., and taken at Carnsore Point (T121038) on 1 September 1980, appears to be the first recorded from Co. Wexford (12).

Notaris acridulus (L.)
Although widely distributed throughout Ireland and the British Isles generally, this species has not been previously recorded from Co. Wexford. A specimen was taken at Lady's Island Lake

(T104071) on 25 May 1987.

Thryogenes nereis (Paykull)
This species is widely distributed throughout England and Wales but only just extends into the lowlands of Scotland. It is somewhat local in Ireland, though widely dispersed. A specimen from Virginia Woods (N5987), taken on 21 May 1989, is new to Co. Cavan (30).

Grypus equiseti (F.)
Though recorded from Kerry, this species has not been widely recorded in southern Ireland, though more widespread in the north. A specimen taken at Curracloe (T1127) on 28 May 1987 constitutes a new record for Co. Wexford (12).

Coeliodes rubicundus (Herbst)
Records of this generally common birch-feeding species are few in southern Ireland. Specimens taken at Killoughrim (S8941 and S9041) on 4 June 1987 and 4 April 1988 are the first reported from Co. Wexford (12).

Ceuthorhynchus contractus (Marsham)
This species, which feeds on a particularly wide range of Cruciferae (Brassicaceae), is widely distributed throughout the British Isles, but has not been reported previously from Co. Wicklow (20). An example was collected at Knocksink (O2117) on 27 March 1987.

Poophagus sisymbrii (F.)
Despite much recording work in the Burren in recent years, this species, which is generally common throughout Ireland on Nasturtium spp., has not previously been recorded from Clare (9). A specimen was taken at L. Bunny (R3696) on 28 May 1984.

Rhynchaenus rusci (Herbst)
This birch-feeding weevil is common throughout the British Isles but has not been previously recorded from Co. Wicklow (20). A specimen was taken at Glendalough (T1195) on 24 April 1989.

Rhampus pulicarius (Herbst)
Because of the recognition that two species have been confused undrr this name (Johnson, 1968), it is desirable that all occurrences of R. pulicarius (and of R. oxyacanthae (Marsham)) be recorded. Even R. pulicarius s. lat. has not been recorded previously from Co. Cork. A specimen of R. pulicarius s. str. was taken at Glengarriff (V920565), West Cork (3), on 12 July 1985.

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Dublin 2,
IRELAND.

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INSTRUCTIONS TO CONTRIBUTORS

1. Manuscripts should follow the format of articles in this Bulletin.

2. Manuscripts should be submitted as typed copy on A4 paper, using double-spacing and 2.5cm (1 inch) margins.

3. Figures should be submitted in a size suitable for reduction to A5 without any loss of detail.

4. Records: please ensure that, when possible, the following information is incorporated in each record included in a manuscript:-

(a) latin name of organism.

(b) statement of reference work used as the source of nomenclature employed in the text. The describer's name should be also given when a zoological species is first mentioned in the text.

(c) locality details including at least a four figure Irish grid reference (e.g. N3946), county, vice-county number and some ecological data about the collection site, plus date of capture.

(d) collector's name and determiner's name (where different from collector's name), and

(e) altitude data should be included where relevant.

(5). Manuscripts should be submitted to the Editor, Dr J. P. O'Connor, at the following address:- National Museum of Ireland, Kildare Street, Dublin 2, IRELAND.

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